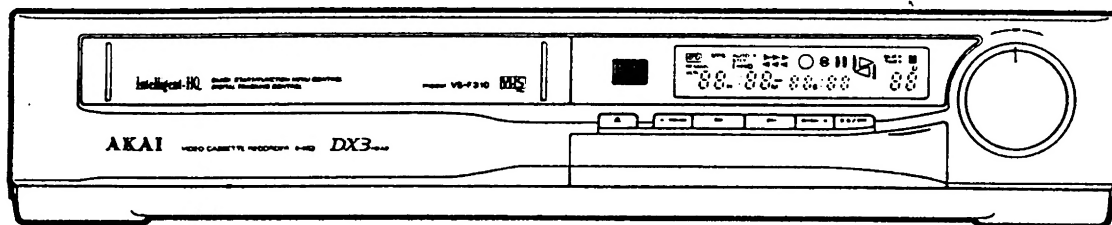


AKAI SERVICE MANUAL



VIDEO CASSETTE RECORDER

MODEL VS-F310EOH

MODEL **VS-F300**EA/EOH

MODEL **VS-F310**^{EK/}EOH, **F320**EM

SPECIFICATIONS

Format		Audio	
EA / EK	VHS standard	Line input level	-6dBs / 50 kohms, unbalanced
EM / EOH	VHS standard (PAL, MESECAM)	Line output level	-6dBs / 1 kohms, unbalanced
Video recording system	Rotary, slant azimuth two-head helical scan system	S / N ratio	More than 40 dB
Rotary heads	3 video heads	Frequency response	70-10,000 Hz
RF. input		Recording / playback time.	
EA	System B, G VHF ch 0 - 5, 5A, 6 - 11 UHF ch 21 - 69	EA / EK / EOH	240 min. with E-240 cassette
EK	System I UHF ch 21 - 69	CCIR (EM)	240 min. with E-240 cassette
EM	System B, G (PAL, SECAM) VHF ch 2 - 12 UHF ch 21 - 69	NTSC playback only (EM) ..	160 min. with T-160 cassette
EOH	System B, G (PAL, SECAM) VHF ch 2 - 4, 5 - 12 UHF ch 21 - 69 Cable ch S1' - S3', S1 - S41	Tape speed	
RF. output		EA / EK / EOH	23.39 mm / sec
EA	System B type modulation VHF ch 0, 1 switchable (preset ch 1)	CCIR (EM)	23.39 mm / sec
EK	System I type modulation UHF ch 30 - 39 adjustable (preset ch 36)	NTSC (EM)	33.35 mm / sec
EM	System B type modulation VHF ch 3, 4 switchable (preset ch 4)	Quick finder	
EOH	System G type modulation UHF ch 30 - 39 adjustable (preset ch 36)	EA / EK / EOH	Approx. 9 times normal speed
Recording (line input)		CCIR (EM)	times normal speed
EA / EK	PAL	NTSC (EM)	Approx. 7 times normal speed
EM / EOH	PAL, SECAM (MESECAM Tape)	FF, REW time	Approx. 5 min. with E-180 cassette
Playback (line output)		Timer	
EA / EK	PAL	Programme	8 programme / 1 year
EM	PAL, SECAM (MESECAM Tape) NTSC 4.43 (NTSC Tape) Simulated PAL (NTSC Tape playback only)	Clock reference	Quartz crystal
EOH	PAL, SECAM (MESECAM Tape)	Display	TV screen & FL (Tape counter, Timer etc.)
Video		Power requirements	
Line input level	0.5 - 2.0 Vp-p / 75 ohms, unbalanced	EA / EK	240 V AC, 50Hz
Line output level	1.0 Vp-p / 75 ohms, unbalanced	EOH	220-230 V AC, 50Hz
S / N ratio	More than 45 dB	EM	110-127 / 220-240 V AC, 50 / 60Hz
Horizontal resolution	More than 250 lines	Power consumption	
		EA / EK / EM	36 W
		EOH	37 W
		Operating temperature	5°C - 40°C
		Dimensions	
		EA	425 (W) x 82 (H) x 320 (D) mm
		EK / EM / EOH	425 (W) x 82 (H) x 322 (D) mm
		Weight	5.0 kg
		Standard accessories	
		Antenna cable	1
		Remote control unit	1
		Batteries for remote control ..	2
		Operator's manual	1

*For improvement purposes, specifications and design are subject to change without notice.

0 dBs = 0.775 V

★ INFORMATION

SYMBOLS OF MODEL NAME FOR PRIMARY DESTINATION

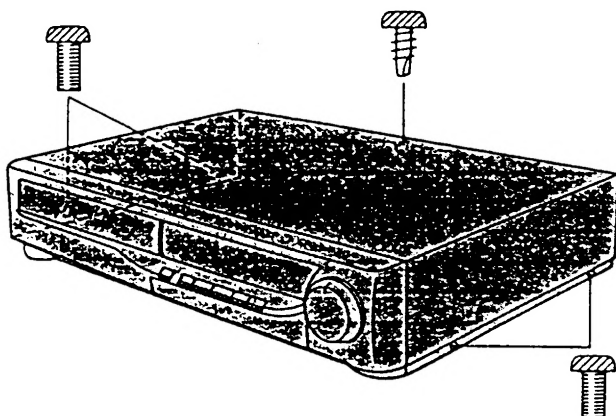
Symbol indicates the destination of the units as listed below.

Symbol	Power Classification	Principal destination	TV System	
			Color	Broadcast
EA	S	Australia	PAL	B,G
ED	E	China	PAL	D
EDG	E	East Europe	PAL	D,K
EDI	E	China, Hong Kong	PAL	D,K,I
EG	E	Spain, Northern Europe, Other	PAL	B,G
	Y7	Saudi Arabia		
EK	B	U.K.	PAL	I
	Y1	Hong kong		
EM	E	Middle East	PAL	B,G
	Y7	Saudi Arabia		
EO	E	Holland, Switzerland, Northern Europe	PAL	B,G
	V	Italy		
EOH	E	Holland, Belgium	PAL	B,G
	V	Italy		
EOG	V	Germany	PAL	B,G
ES	E	South Africa, Ireland, Hong kong	PAL	I
EV	E	South-East Asia	PAL	B,G
	U	Middle East, South-East Asia		
	Y1	New Zealand		
	Y7	Saudi Arabia		
EZ	S	New Zealand	PAL	B,G
EGN	E	Middle East	PAL,NTSC	B,G
	Y7	Saudi Arabia		
S	E	France	SECAM	L
SK	E	Latin America, Oceania, SECAM-OIRT	SECAM	K,K1
SEG	E	France, Switzerland	SECAM,PAL	L,B,G
U	A	U.S.A.	NTSC	M
	C	Canada		
UM	U	Latin America	NTSC	M
J	J	Japan	NTSC	M

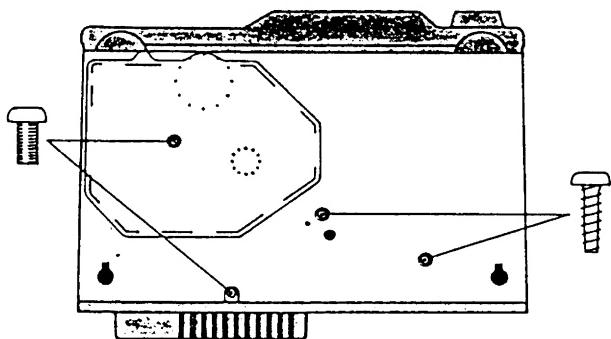
I. DISASSEMBLY

In case of trouble, etc. necessitating dismantling, please dismantle in the order shown in the illustrations. Reassemble in reverse order. When reattaching the FRONT PANEL, hold the cassette loading slot door in the upright (open) position.

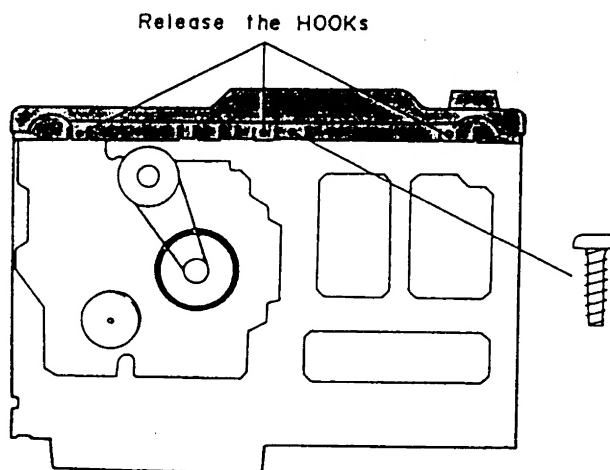
1. Removal of UPPER COVER



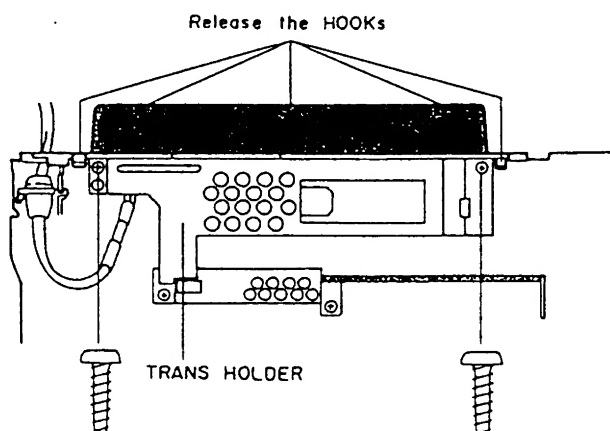
2. Removal of BOTTOM COVER



3. Removal of FRONT PANEL



4. Removal of TRANS COVER



II. PRINCIPAL PARTS LOCATION

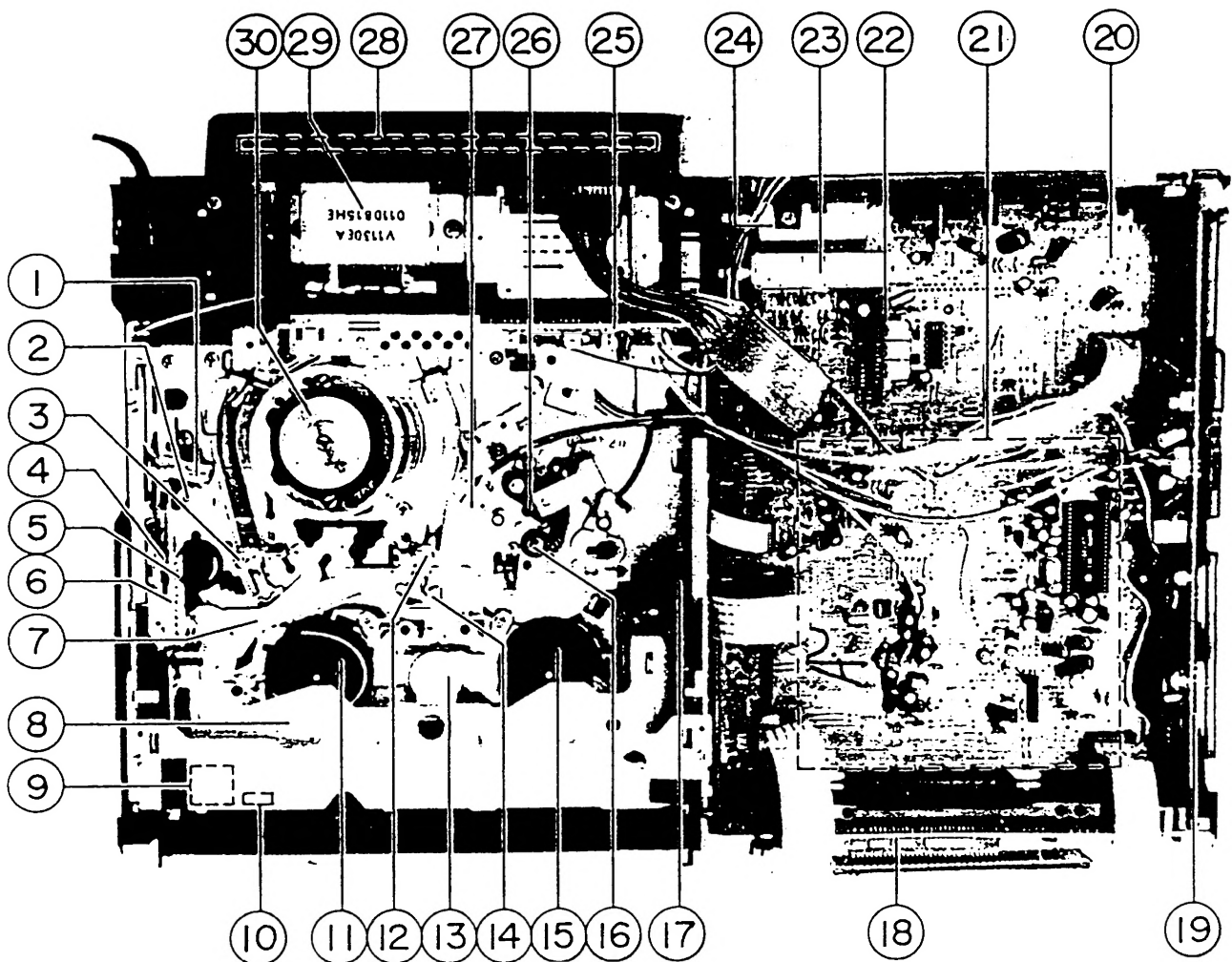


Fig. 2-1 Top view

- | | |
|--------------------------------|-------------------------------------|
| 1. FULL TRACK ERASE HEAD | 16. CAPSTAN MOTOR |
| 2. SUPPLY TAPE GUIDE | 17. SENSOR (T) (START SENSOR) |
| 3. SUPPLY LOADING LEADER | 18. OPERATION (A) PCB |
| 4. SENSOR (S) PCB (END SENSOR) | 19. MAIN (B) PCB |
| 5. FRONT LOADING GEAR | 20. MAIN (A) PCB |
| 6. FRONT LOADING SLIDER | 21. VPT / VPS PCB (OPTION) |
| 7. TENSION ARM | 22. VIF UNIT |
| 8. CASSETTE LOAD BLK | 23. TUNER UNIT |
| 9. LOADING MOTOR | 24. RF CONVERTOR UNIT |
| 10. REC SAFETY SWITCH | 25. PRE AMP PCB |
| 11. SUPPLY REEL TABLE | 26. PINCH ROLLER |
| 12. TAKE UP LOADING LEADER | 27. AUDIO / CONTROL / S. ERASE HEAD |
| 13. IDLER PART | 28. POWER SUPPLY PCB |
| 14. SENSOR LED | 29. POWER TRANSFORMER |
| 15. TAKE UP REEL TABLE | 30. VIDEO HEAD DRUM BLOCK |

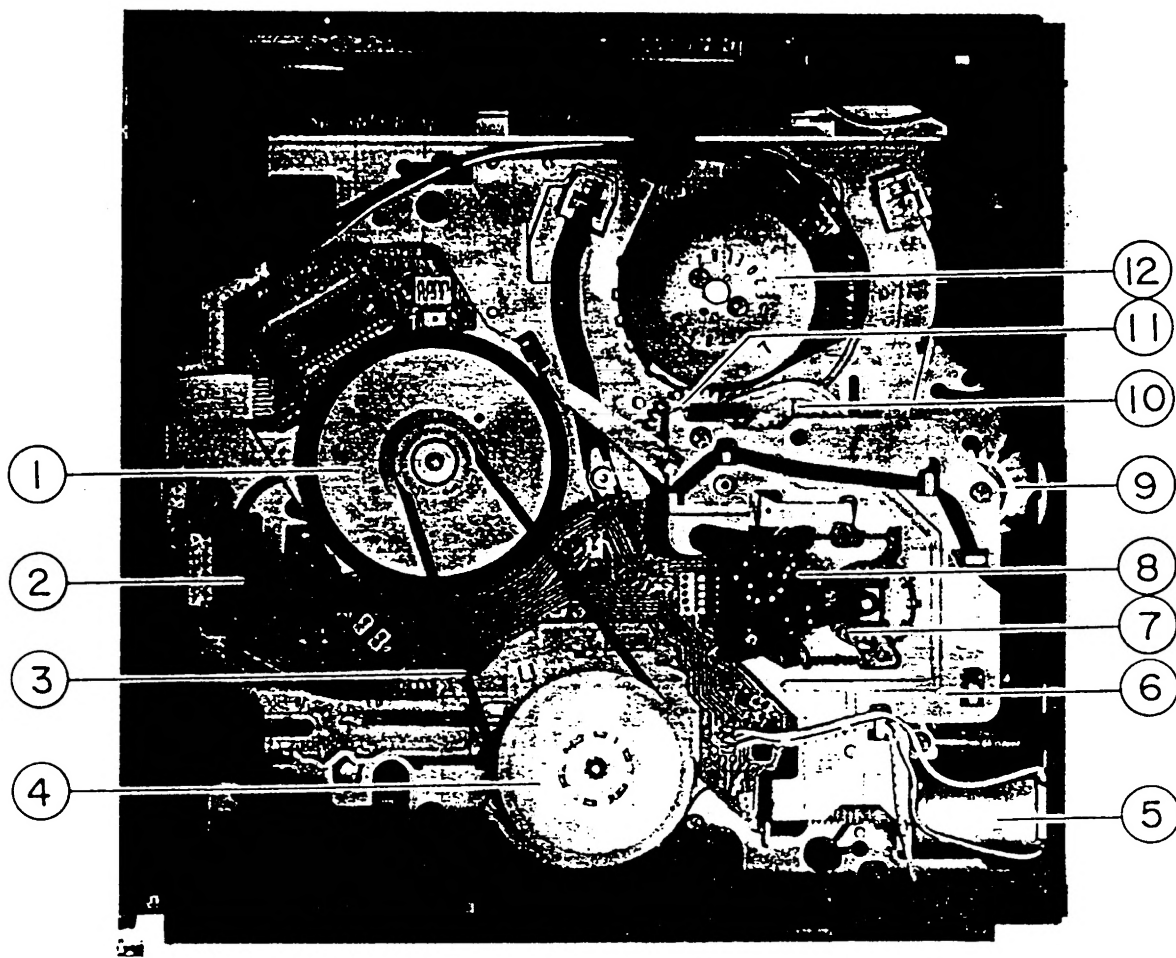


Fig. 2-2 Bottom view

- | | |
|------------------------|---------------------------|
| 1. CAPSTAN MOTOR BLOCK | 7. CAM SLIDER GEAR |
| 2. SENSOR PCB | 8. MODE SELECT SWITCH |
| 3. CAPSTAN BELT | 9. FRONT LOADING GEAR |
| 4. CLUTCH DISK PART | 10. TOGGLE (S) GEAR BLOCK |
| 5. LOADING MOTOR | 11. TOGGLE (T) GEAR BLOCK |
| 6. LOADING DRIVE BLOCK | 12. DRUM MOTOR BLOCK |

III. MAIN COMPONENTS REPLACEMENT

3-1. REMOVAL OF THE EJECTOR BLOCK

* Set the loading mechanism to the "EJECT" position by pressing the EJECT button. Then disconnect the AC power plug from the AC socket before proceeding.

3-1-1. Removal of the CASSETTE LOAD BLK

- 1) Remove the two (A) screws on the UPPER PLATE as shown in Fig. 3-1 then remove the UPPER PLATE.
- 2) Lift up the FRONT GUIDE while pushing the CASSETTE LOAD BLK backward, then remove the FRONT GUIDE.
- 3) Lift up the front side of the CASSETTE LOAD BLK gently then remove it. To avoid damaging the pins of the CASSETTE LOAD BLK and the groove of the MECHA. FRAME, do not add excessive force to the CASSETTE LOAD BLK when removing it.

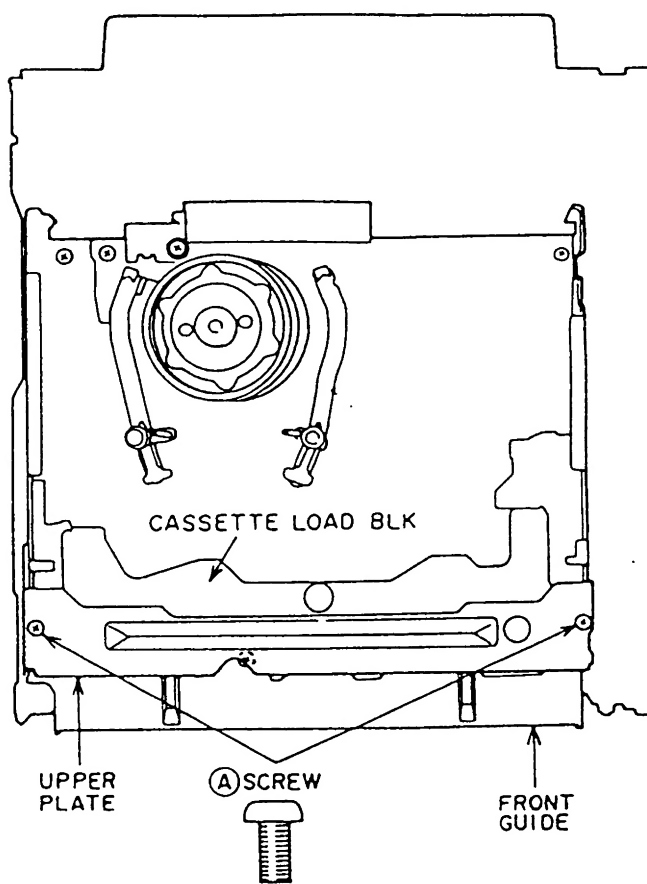


Fig. 3-1

3-1-2. Removal of the LOADING ARM BLK

- 1) Release the stopper on the right side end of the LOADING ARM BLK's shaft (Refer Fig. 3-2) by pressing the stopper tab with a flat head (—) screwdriver. Then remove the shaft's right end from the bracket.

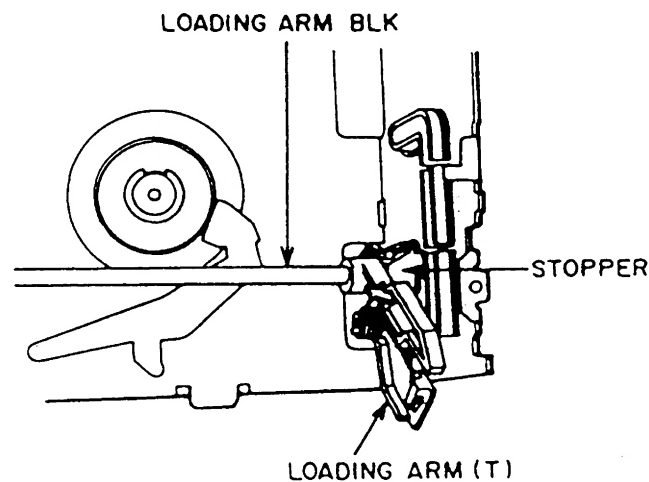


Fig. 3-2

- 2) Hold the LOADING ARM (T) and turn it 30 degrees clockwise, then pull out the shaft's left end from the bracket. To avoid damaging the JOINT GEAR and EJECT GEAR, take special care when removing. (Refer Fig. 3-3)

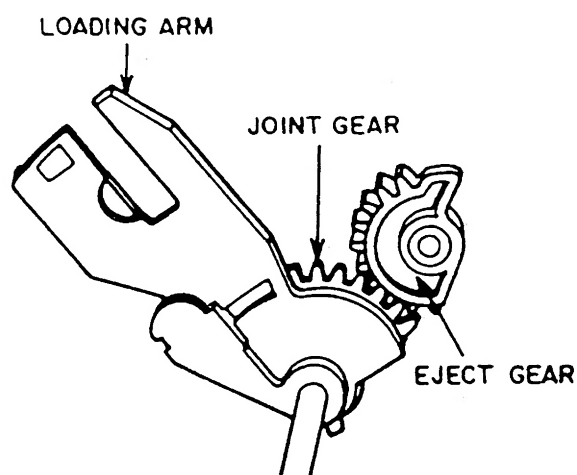


Fig. 3-3

3-2.REMOVAL OF THE SENSOR PC BOARD

* Before proceeding with removal of the SENSOR PCB the loading mechanism must be set to the "unloaded" position (the position where the CAM SLIDER GEAR's groove mark is visible through the hole of the MODE SELECT SW.) as shown in Fig. 3-4.

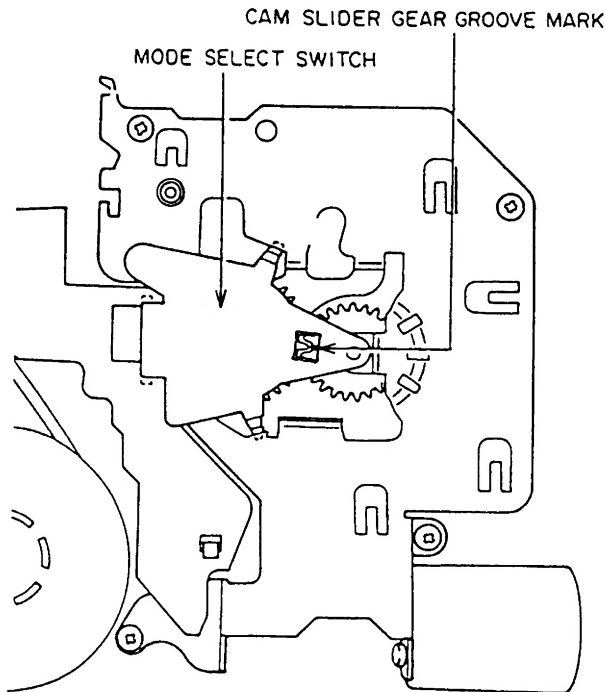


Fig. 3-4

To set the loading mechanism to the "unloaded" position, proceed with one of the following 1) or 2) procedures.

- 1) Insert a video cassette tape which you no longer need. Once the tape has been loaded or has entered the "play" mode press the POWER button to turn the power off. Disconnect the AC power plug from the AC socket after the cassette tape has been unloaded.
- 2) Remove the UPPER PLATE, FRONT GUIDE and CASSETTE LOAD BLK. (Refer to 3-1-1. Removal of the CASSETTE LOAD BLK.) Plug in the AC power cord. The LOADING ARM BLK will move backward and then both the LOADING LEADERS will be set to the "tape loaded position" automatically. Wait more than 10 seconds. (After the PINCH ROLLER is disengaged from the CAPSTAN and the SUPPLY REEL stops its rotation, the mechanism is set to "stand-by".) Press the RESET button on the OPERATION PCB. The mechanism will be set to the "tape unloaded position" thereafter. Disconnect the AC power plug from the AC power socket.

3-2-1. Removal of the MODE SELECT SWITCH

- 1) Release the two (A) stoppers as shown in Fig. 3-5.

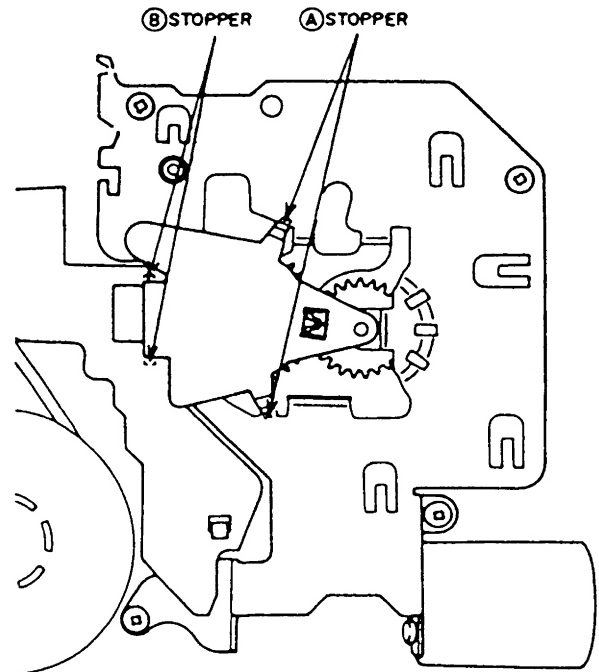


Fig. 3-5

- 2) Release the two (B) stoppers carefully while pulling up the MODE SELECT SWITCH. Then remove the MODE SELECT SWITCH. (Do not damage the pins of the MODE SELECT SWITCH or the connector P1 on the SENSOR PCB).

3-2-2. Removal of the SENSOR PC Board

- 1) Disconnect the connector P303 on the MAIN (A) PCB.
- 2) Remove the capstan belt.
- 3) Release the (A), (B) and (C) stoppers as shown in Fig. 3-6. Then remove the SENSOR PCB.

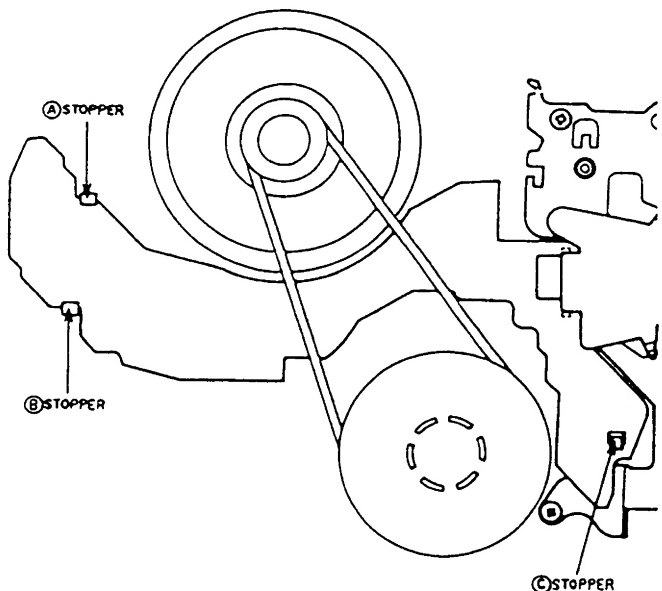


Fig. 3-6

3-3.REMOVAL OF THE LOADING DRIVE BLK

Set the loading mechanism at the "unloaded" position as well as 3-2 (REMOVAL OF THE SENSOR PC BOARD). However this time, to avoid damaging the tape and mechanical parts, refer to 3-2, *(2) only.

- 1) Remove the MODE SELECT SWITCH in the same manner as 3-2-1 (Removal of the MODE SELECT SWITCH).
- 2) Unhook the five wires from each tab. Two wires from the SENSOR(S), two wires from the LOADING MOTOR and one wire from the REC SAFETY SWITCH.
- 3) Remove the (A), (B), (C) and (D) screws, then remove the LOADING DRIVE BLK as shown in Fig. 3-7.

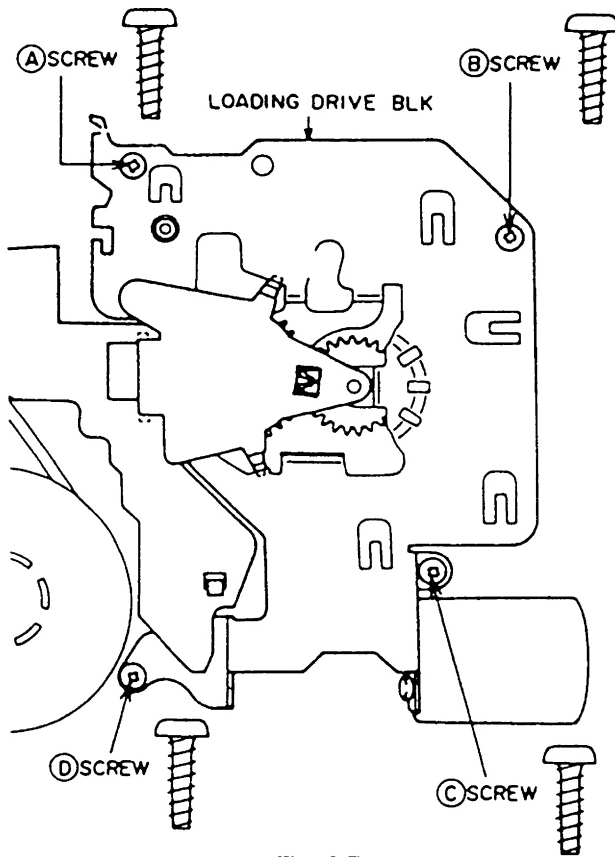


Fig. 3-7

3-4.REASSEMBLY OF THE LOADING MECHANISM BLK

3-4-1. Position of the TOGGLE GEARS (T) and (S)

- 1) Set the TOGGLE GEAR (T) and TOGGLE GEAR (S) to the unloaded position with your fingers. Align the (A) mark on the TOGGLE GEAR (S) with the (A) hole of the TOGGLE GEAR (T) as shown in Fig. 8.

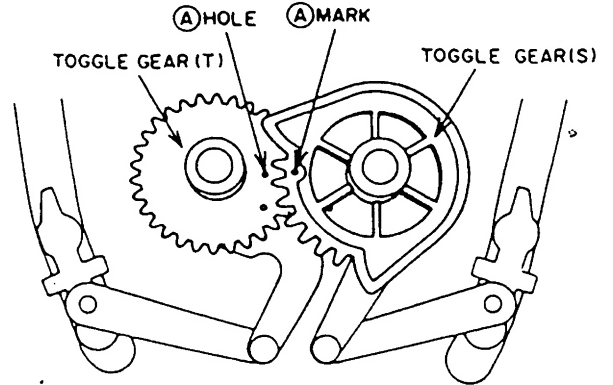


Fig. 3-8

3-4-2. Installation of the CAM SLIDER GEAR & FRONT LOADING GEAR

- 1) Attach the WORM WHEEL GEAR as shown in Fig. 3-9.

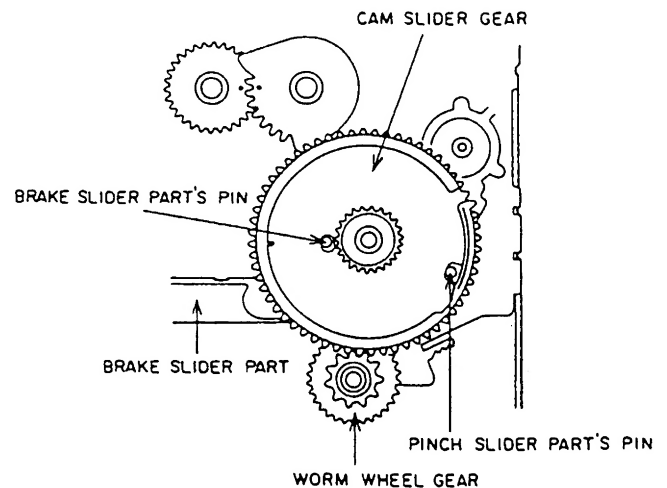


Fig. 3-9

- 2) Set the CAM SLIDER GEAR. At this time, adjust the position of the BRAKE SLIDER PART and PINCH SLIDER PART so that both pins appear through the holes on the CAM SLIDER GEAR as shown in Fig.3-9.

- 3) Attach the FRONT LOADING GEAR as shown in Fig. 3-10. At this time, align the Ⓑ mark on the FRONT LOADING GEAR with the Ⓑ hole of the FRONT LOADING SLIDER as shown in Fig. 3-11.

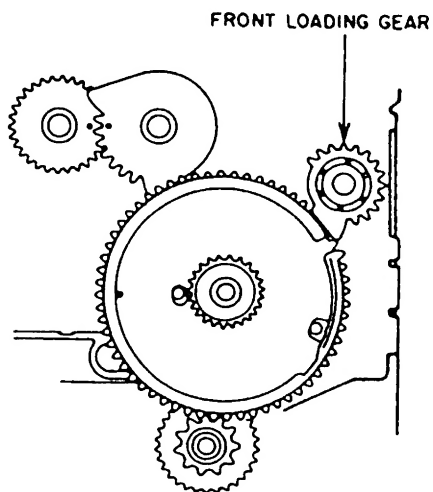


Fig. 3-10

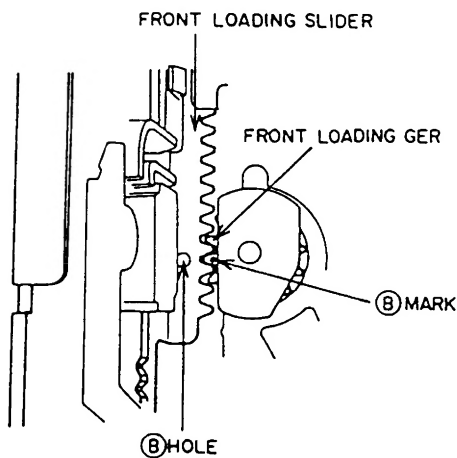


Fig. 3-11

3-4-3. Confirmation of the position of the EJECT GEAR

- 1) Confirm that the EJECT GEAR is in the correct position as shown in Fig. 3-12.

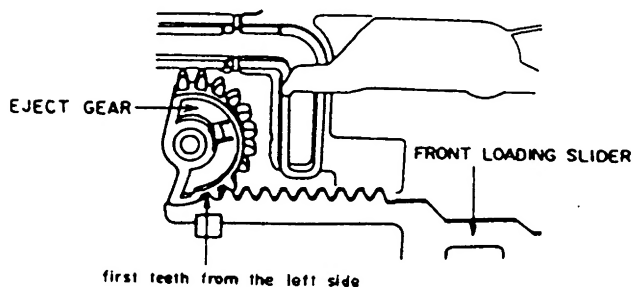


Fig. 3-12

- 2) Install the LOADING DRIVE BLK as shown in Fig. 3-13.

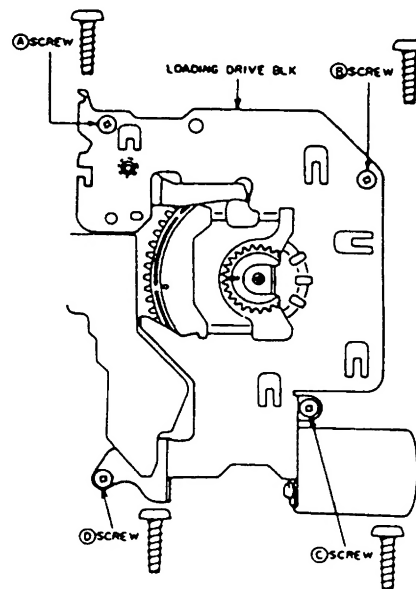


Fig. 3-13

3-4-4. Installation of the MODE SELECT SWITCH

- 1) Set the MODE SELECT SWITCH's gear so that the Ⓒ mark is in the center of the Ⓒ hole as shown in Fig. 3-14.

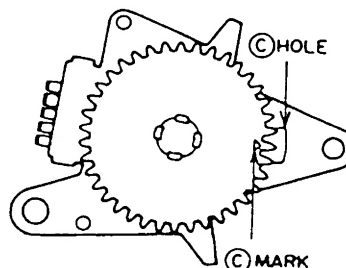


Fig. 3-14

- 2) Attach the MODE SELECT SWITCH to the LOADING DRIVE BLK. At this time, align the hollow of the gear's tooth (reverse side of the Ⓒ mark) with the Ⓒ groove of the CAM SLIDER GEAR as shown in Fig. 3-15.

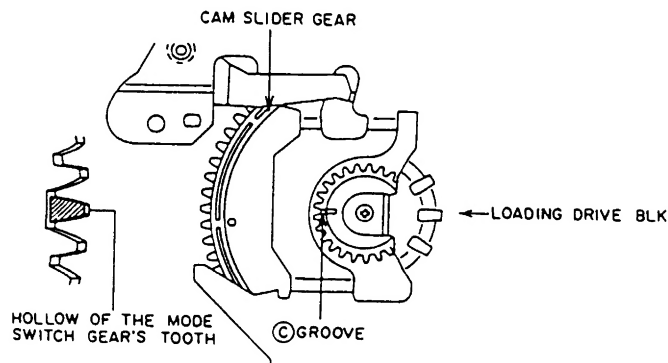


Fig. 3-15

3-4-5. Installation of the LOADING ARM BLK

- 1) While covering the SENSOR (S) with your fingers, connect the AC power plug to the AC socket. The FRONT LOADING SLIDER will reach the "EJECT" position. Then disconnect the AC power plug from the AC socket before you release your fingers from the SENSOR (S).
- 2) Install the LOADING ARM BLK in the reverse order of 3-1-2 (Removal of the LOADING ARM BLK). Set the position between both the EJECT GEAR and the JOINT GEAR as shown in Fig. 3-16.

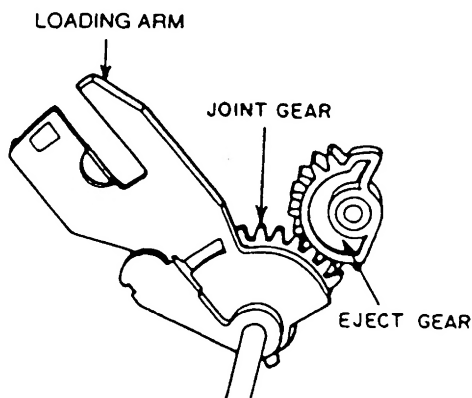


Fig. 3-16

3-4-6. Installation of the CASSETTE LOAD BLK, FRONT GUIDE and UPPER PLATE

- 1) Attach the CASSETTE LOAD BLK, FRONT GUIDE and UPPER PLATE in the reverse order of 3-1-1 (Removal of the CASSETTE LOAD BLK).
- 2) Insert a video cassette tape and confirm that the loading mechanism will operate properly.

3-5. REPLACEMENT OF THE PINCH HOLDER PART

- 1) Remove the grip ring and release the stopper of the PINCH ARM and remove the PINCH ARM BLK as shown in Fig 3-17.

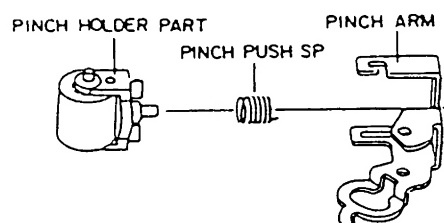
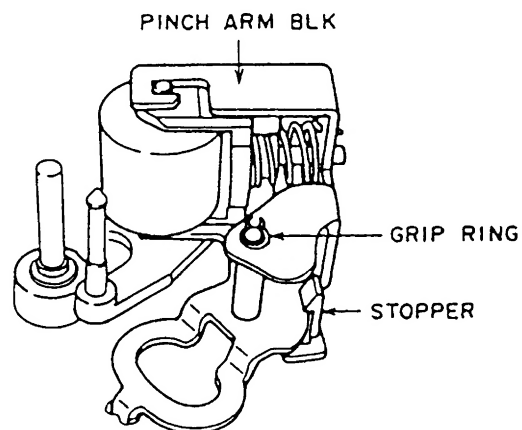


Fig. 3-17

- 2) Turn the PINCH HOLDER PART 30 degrees clockwise while pushing it backward and remove the PINCH HOLDER PART from the PINCH ARM.
- 3) Reassemble the PINCH ROLLER ARM BLK in the reverse order of 1) to 2).

3-6. REPLACEMENT OF THE IDLER PART AND REVIEW BRAKE PART

- 1) Remove the REWIND BRAKE PART, CASSETTE LOAD BLK & ARM LOADING BLK. (Refer to 3-1, REMOVAL OF THE EJECTOR BLK.)
- 2) Release the stopper of the IDLER PART as shown in Fig. 3-18, then remove it.

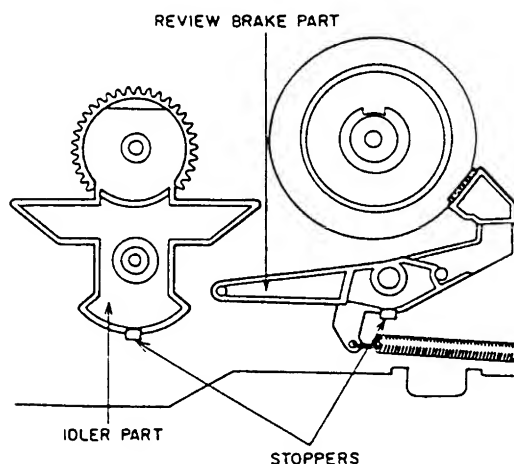


Fig. 3-18

- 3) Take off the review brake part spring, then release the stopper of the REVIEW BRAKE PART and remove it.
- 4) Reassemble these parts in the reverse order of 1) to 3).

3-7. REPLACEMENT OF THE UPPER DRUM

3-7-1. Removal of the UPPER DRUM

- 1) Unsolder the six relay leads and remove the two upper drum fixing screws as shown in Fig. 3-19.
- 2) Gently lift and remove the UPPER DRUM.

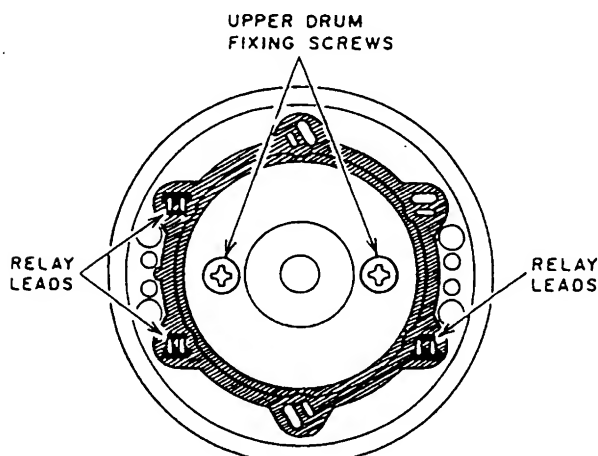


Fig. 3-19

3-7-2. Installation of the UPPER DRUM

- 1) Attach the UPPER DRUM to the LOWER DRUM ROTOR so that the upper drum convex (A) and lower drum rotor's white mark are in the same direction as shown in Fig. 3-20.

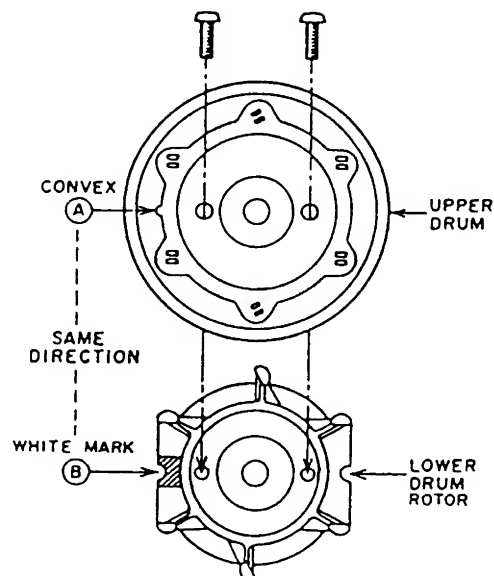


Fig. 3-20

NOTE: Because height precision is required for proper performance, and because head tips are fragile, the following points should be noted when replacing the UPPER DRUM BLOCK.

- a) Do not loosen the set screw on the collar preload.
- b) Before fixing, use alcohol to clean both surfaces where the upper drum and the rotary transformer meet.
- c) If the UPPER DRUM can not be inserted on to the shaft easily during installation, clean the hole in the UPPER DRUM with alcohol and put a little oil on the shaft.
- d) Make sure that the upper drum fixing screw holes on the rotary transformer part and the upper drum fixing screw penetration holes match exactly before inserting the fixing screws.
- e) Tighten the two upper drum fixing screws alternately and gradually.

3-7-3. After replacement

After replacement, the following adjustments are necessary for the proper performance.

- 1) Control head Phase adjustment. (IV. MECHANICAL ADJUSTMENT 4-3-3.)
- 2) PB switching point adjustment. (V. ELECTRICAL ADJUSTMENT Step 1)
- 3) Video head REC current adjustment. (V. ELECTRICAL ADJUSTMENT Step 6)
- 4) ENV. DET (I-HQ) adjustment. (V. ELECTRICAL ADJUSTMENT Step 10)

3-8.DRUM MOTOR PC BOARD REPLACEMENT

- 1) Remove the two (A) screws on the ROTARY PLATE and remove the ROTARY PLATE.
Then disconnect the connector on the DRUM MOTOR PCB as shown.

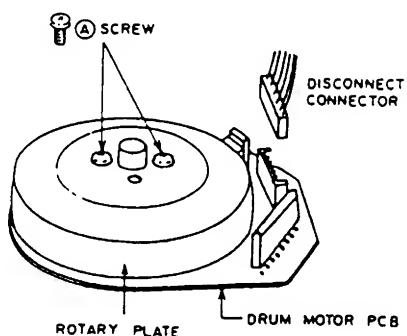


Fig. 3-21

- 2) Remove the three (B) screws which retain the DRUM MOTOR PCB and replace the DRUM MOTOR PCB.

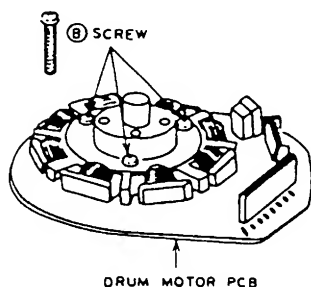


Fig. 3-22

- 3) Attach the ROTARY PLATE to the collar preload so that the rotary plate (C) hole and collar preload (D) hole are in the same direction.

3-9.REMOVAL OF THE MECHANISM BLOCK

3-9-1. Removal of the PRE AMP PC Board

- 1) Remove the two (A) screws then pull up the PRE AMP PCB as shown in Fig. 3-24.

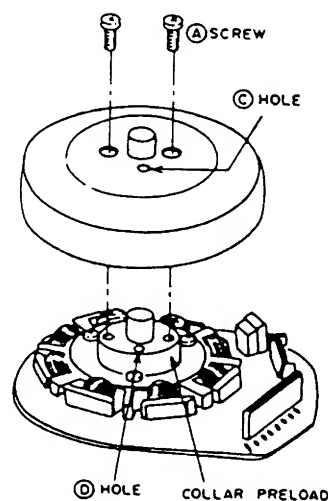


Fig. 3-24

3-9-2. Removal of the MECHANISM BLK (MECHA. FRAME)

- 1) Disconnect the connectors P301, P302, P303, on the MAIN (A) PCB and P1 on the A/C HEAD PCB.
- 2) Remove the three (C) screws from the MECHA. FRAME as shown in Fig. 3-24.
- 3) Hold the rear side of the MECHA. FRAME then remove by pulling up backward.
- 4) Reassemble in the reverse order for installation.

Fig. 3-23

IV. MECHANICAL ADJUSTMENT

4-1. BACK TENSION ADJUSTMENT

- 1) Play back a recorded tape which is no longer needed.
- 2) Confirm that the (A) groove on the TENSION ARM aligns with right end of the (A) mark on the MECHA. CHASSIS as shown in Fig.4-1.
- 3) If the result is not satisfactory, eject the tape and adjust the TENSION ADJUST repeatedly until the result is satisfactory.

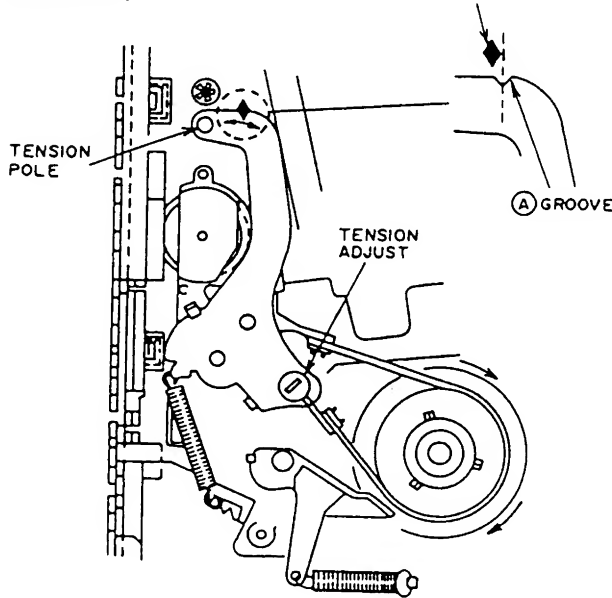


Fig. 4-1

4-2. TAPE TRANSPORT ADJUSTMENTS

NOTE: The following adjustments are required only when an irregularity is found since these adjustment are performed precisely at the factory.

4-2-1. Tape curl adjustment at the TAKE-UP TAPE GUIDE

- 1) Play back a recorded tape which is no longer needed.
- 2) Turn the (A) screw on the A/C HEAD BLK until the edge of the tape barely touches the lower part of TAKE-UP TAPE GUIDE without any curl or wrinkle.
- 3) Once the (A) screw is adjusted, A/C HEAD height and azimuth adjustment is required. (Refer to 4-3. A/C HEAD POSITION ADJUSTMENT.)

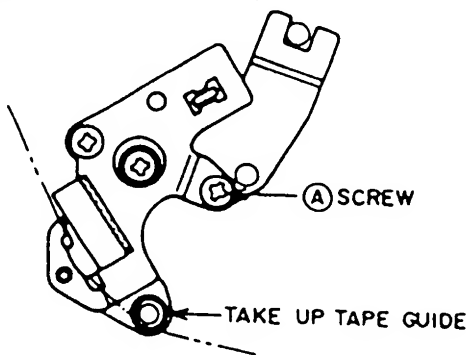


Fig. 4-2

(TAPE-UP TAPE GUIDE)

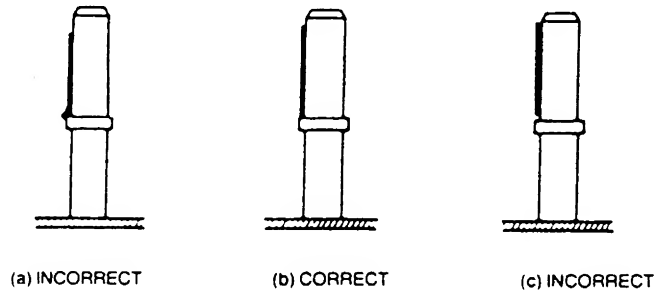


Fig. 4-3

4-2-2. Confirmation of tape curl at the SUPPLY TAPE GUIDE

Confirm that the edge of the tape barely touches the lower part of the SUPPLY TAPE GUIDE without any curl or wrinkle as shown in Fig.4-4.

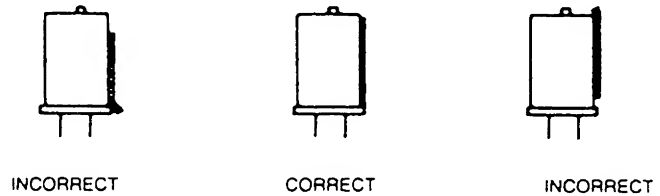


Fig. 4-4

4-2-3. REVIEW ARM height adjustment

- 1) Play back the beginning part of an E-240 (T-160) tape and set the unit in the REVIEW mode by pressing the REW button. (Remove the tape protection cover to make the adjustment easy.)

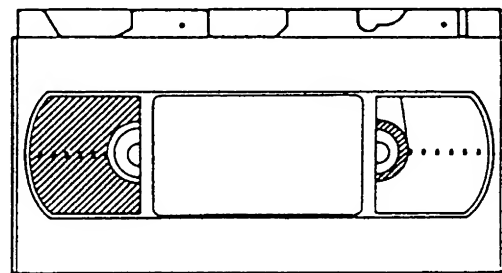


Fig. 4-5

- 2) Turn the REVIEW ARM height ① nut so that the edge of the tape barely touches the lower part of the TAKE-UP TAPE GUIDE without any curl or wrinkle between the TAKE-UP TAPE GUIDE and the CAPSTAN SHAFT as shown in Fig.4-6 to Fig.4-8.

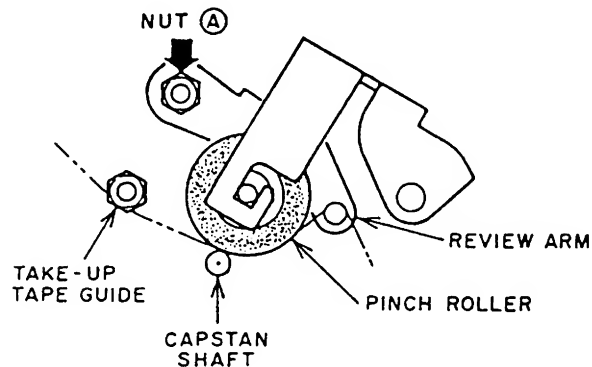


Fig. 4-6

(TAKE-UP TAPE GUIDE)

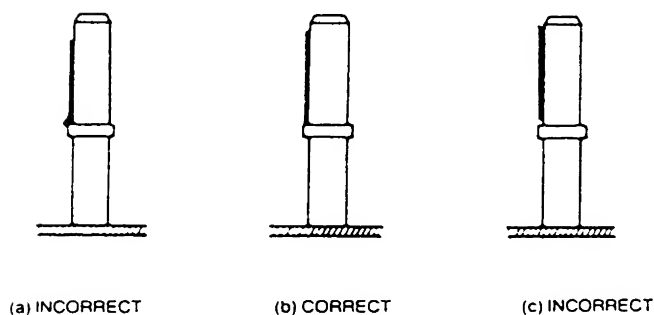


Fig. 4-7

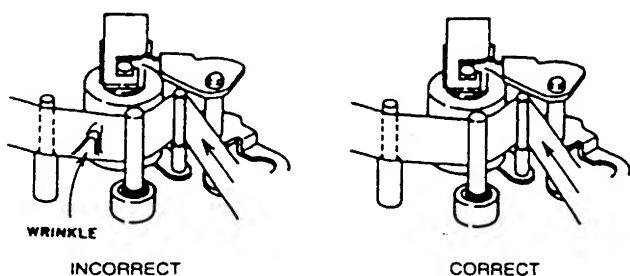


Fig. 4-8

- 3) Play back the beginning part of an E-240 (T-160) tape and this time set the unit in the QUE mode by pressing the F.FWD button.
- 4) Confirm there is no curl or wrinkle at REVIEW ARM's guide.
If curl or wrinkle of the tape has occurred, slightly turn the ① nut (Shown in Fig.4-6) until it disappears.

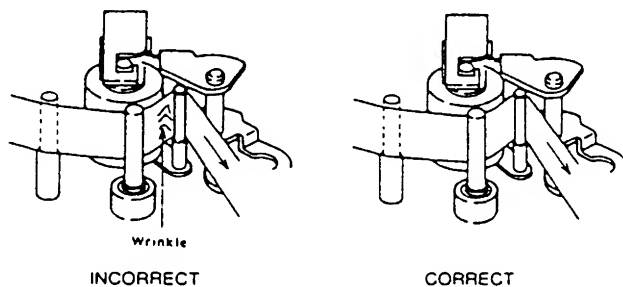


Fig. 4-9

- 5) Set the unit in REVIEW mode again. Then confirm that there is no curl or wrinkle at the TAKE-UP TAPE GUIDE. (A small gap may appear after this adjustment, but this is allowable)

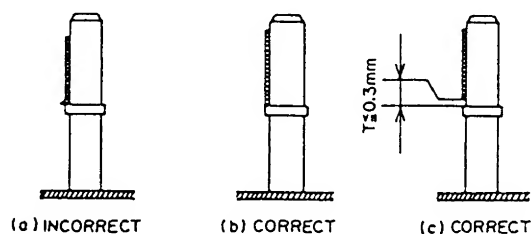


Fig. 4-10

NOTE:

1. If results are not satisfactory, repeat steps 2) to 5).
2. Always play an undamaged tape to obtain satisfactory adjustment.
3. Because an E-240 (T-160) tape can easily be damaged due of its thinness, a pre-adjustment with an E-180 (T-120) tape is recommended.

4-2-4. LOADING LEADER height adjustments

- 1) Slightly loosen the set screw at the lower part of the LOADING LEADERS (L), (R) so that the LOADING LEADER can be adjusted with reasonable tightness. (Refer Fig.4-11.)

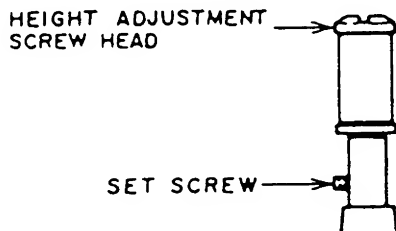


Fig. 4-11

- 2) Play back the reference tape TF-530RFS (AT-751775).
- 3) Connect an oscilloscope's CH-1 to the TR510 emitter (ENVE) on the MAIN (A) PCB and CH-2 to the TP1 (VSWP) on the PRE AMP PCB for triggering.
- 4) Turn the LOADING LEADER heads with a flat head (—) screwdriver to obtain flat RF envelope as ideal envelope as shown in Fig.4-12.
- 5) After adjustment is completed, tighten the loading leader set screws.

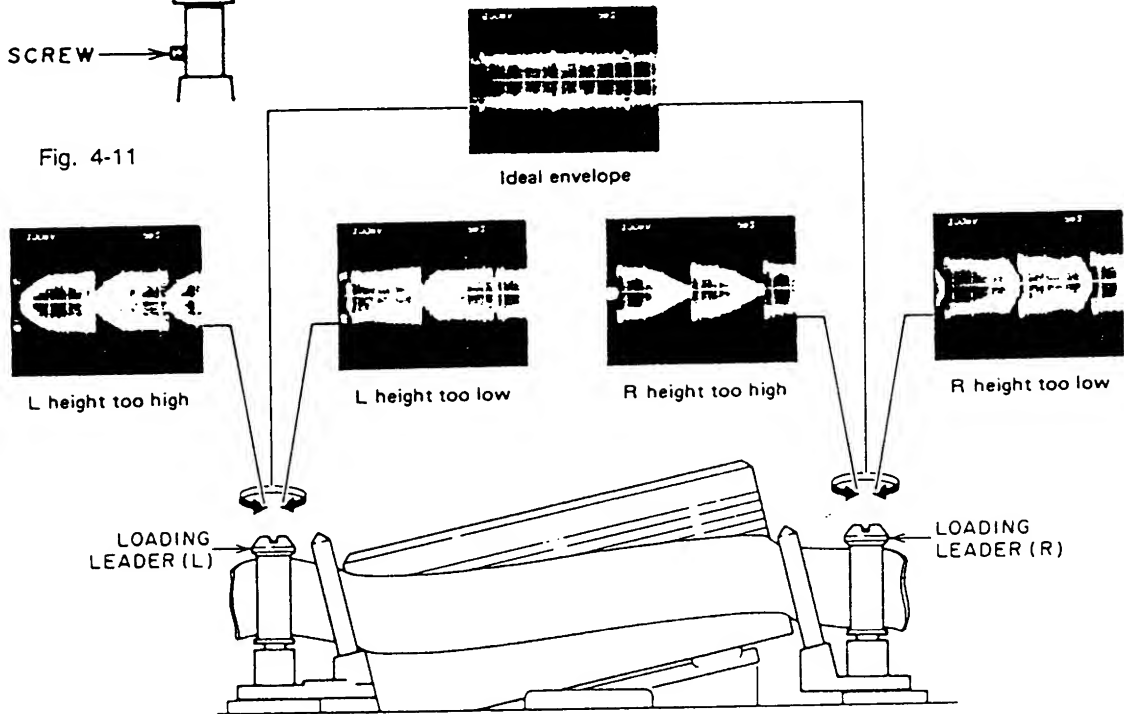


Fig. 4-12

4-3.A/C HEAD POSITION ADJUSTMENT

4-3-1. Azimuth adjustment

- 1) Connect an AC voltmeter or an oscilloscope to the AUDIO OUT terminal on the rear panel.
- 2) Play back the reference tape TF-530RFS (AT-751775).
- 3) Adjust the Ⓐ screw to obtain the maximum audio output.

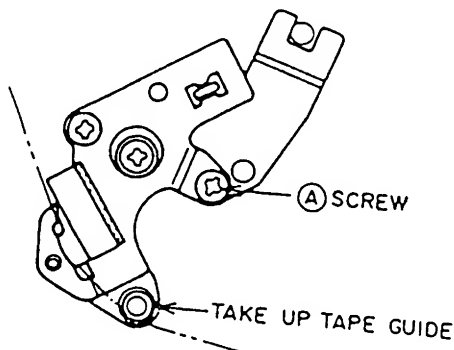


Fig.4-13

4-3-2. Height adjustment

- 1) Play back the test tape TF-526HH (AT-751788).
- 2) Connect an oscilloscope's CH-1 to the AUDIO OUT on the rear panel and CH-2 to the TP301 (CTL OUT) on the MAIN (A) PCB.
- 3) Turn the hexagon screw to obtain 1/2 of the output level of either CH-1 or CH-2 whichever has an output signal as shown in Fig.4-14. Then set both of the oscilloscope's channels to 100mV/div and finely adjust the hexagon screw until both signals of CH-1 and CH-2 are nearly the same level.
- 4) Slightly turn the Ⓐ screw until the tape edge barely touches the lower part of the TAKE-UP TAPE GUIDE without any curl or wrinkle as shown in Fig.4-3.
- 5) Adjust the head azimuth again. (Turning the hexagon screw or Ⓐ screw will cause head azimuth mis-alignment. Refer to 4-3-1. Azimuth adjustment.)
- 6) Confirm that both signals of CH-1 and CH-2 are nearly the same level (Confirm that neither of the CH-1 or CH-2 output level exceed 100mVp-p). If the result is not satisfactory, repeat steps 3) to 5).

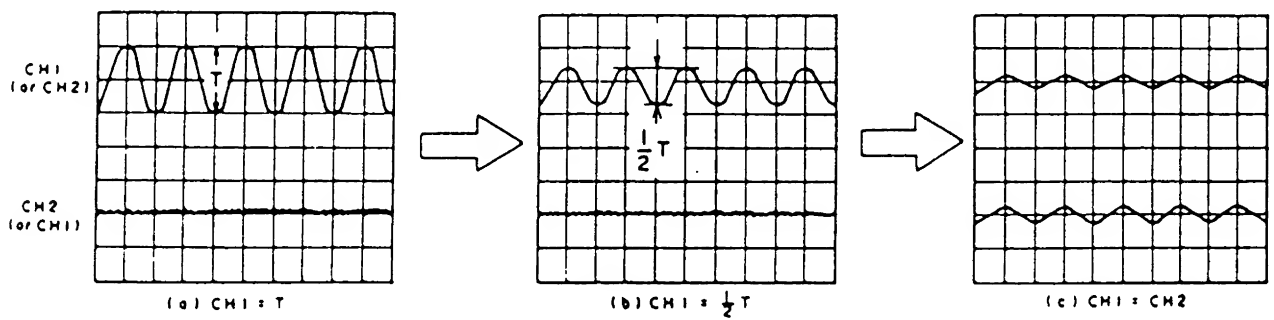


Fig. 4-14

4-3-3. phase adjustment

- 1) Connect an oscilloscope's CH-1 to the TR510 emitter (ENVE) on the MAIN (A) PCB and CH-2 to the TP1 (VSWP) on the PRE AMP PCB for triggering.
- 2) Play back the reference tape TF-530RFS (AT-751775).
- 3) Press one of the TRACKING buttons on the remote control until the "x" mark can be seen in the center position of the tracking range on the TV screen as shown in Fig.4-15.

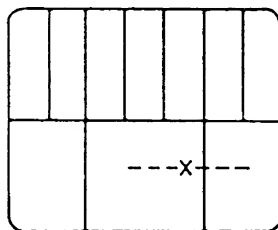


Fig. 4-15

- 4) Loosen the © screw slightly so that the A/C HEAD PLATE can be moved with reasonable tightness.
- 5) Insert a sharp flat head (—) screwdriver into the A/C HEAD BASE and (A) hole as shown in Fig.4-17.
- 6) Move the A/C HEAD BASE by moving a screwdriver in the direction of the arrow as shown in Fig.4-17 to obtain the maximum RF output, then tighten the © screw.

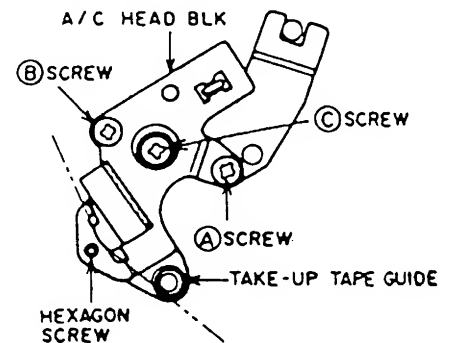


Fig. 4-16

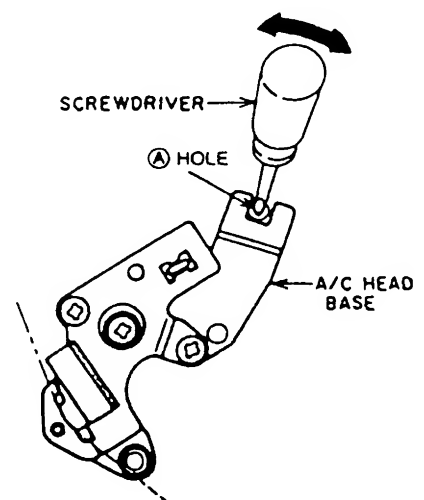


Fig. 4-17

V. ELECTRICAL ADJUSTMENT

Precautionary Items prior to adjustments

1. The color bar generator output should be 1.0 Vp-p
2. The video output terminal should be terminated with 75 ohms (connect dummy load or 75 ohms input TV.)

Required following test tapes.

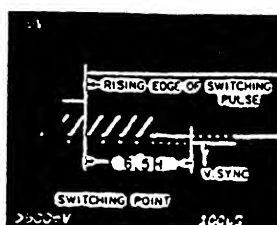
Test tape	Parts No.
TF-527BL	AT-711880
TF-530RFS	AT-751775
TF-532CBS	AT-751360

STEP	ADJUSTMENT ITEM
1.	MODE and INPUT SIGNAL / TEST TAPE
2.	TEST POINT and ADJ part
3.	REMARKS (*) & RESULT (*)

ADJ. part
Test point

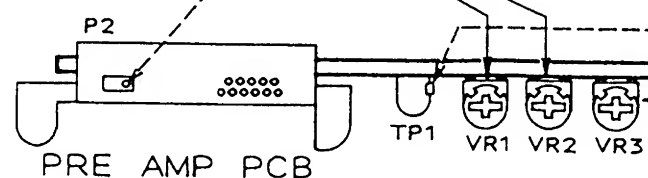
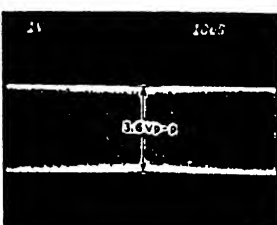
1 PB SWITCHING POINT

1. "PB", test tape TF-530RFS
2. TP1 (SWP), VIDEO OUT & VR301 (SW. POINT)
3. Connect an oscilloscope's CH-1 to TP1 (SWP) for triggering and CH-2 to VIDEO OUT
- * Adjust VR301 so that the switching point is positioned 6.5 H from the V-SYNC left edge as shown.



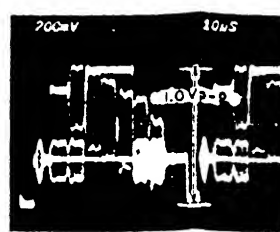
6 VIDEO REC CURRENT

1. "REC", PAL color bar signal
2. P2 (REC. CURR), JW188 (C. SYNC) & VR1 (REC-CHROMA), VR2 (REC-Y)
3. Connect an oscilloscope's CH-1 to P2 (REC.CURR) and CH-2 to JW188 (C.SYNC) for triggering.
- Turn the VR2 (REC-Y) fully counterclockwise.
- * Adjust VR1 (REC-CHROMA) so that the chroma REC current becomes 140 mVp-p at the burst signal area.
- * Disconnect the input signal, then adjust VR2 (REC-Y) so that Y REC current becomes 3.6 Vp-p.



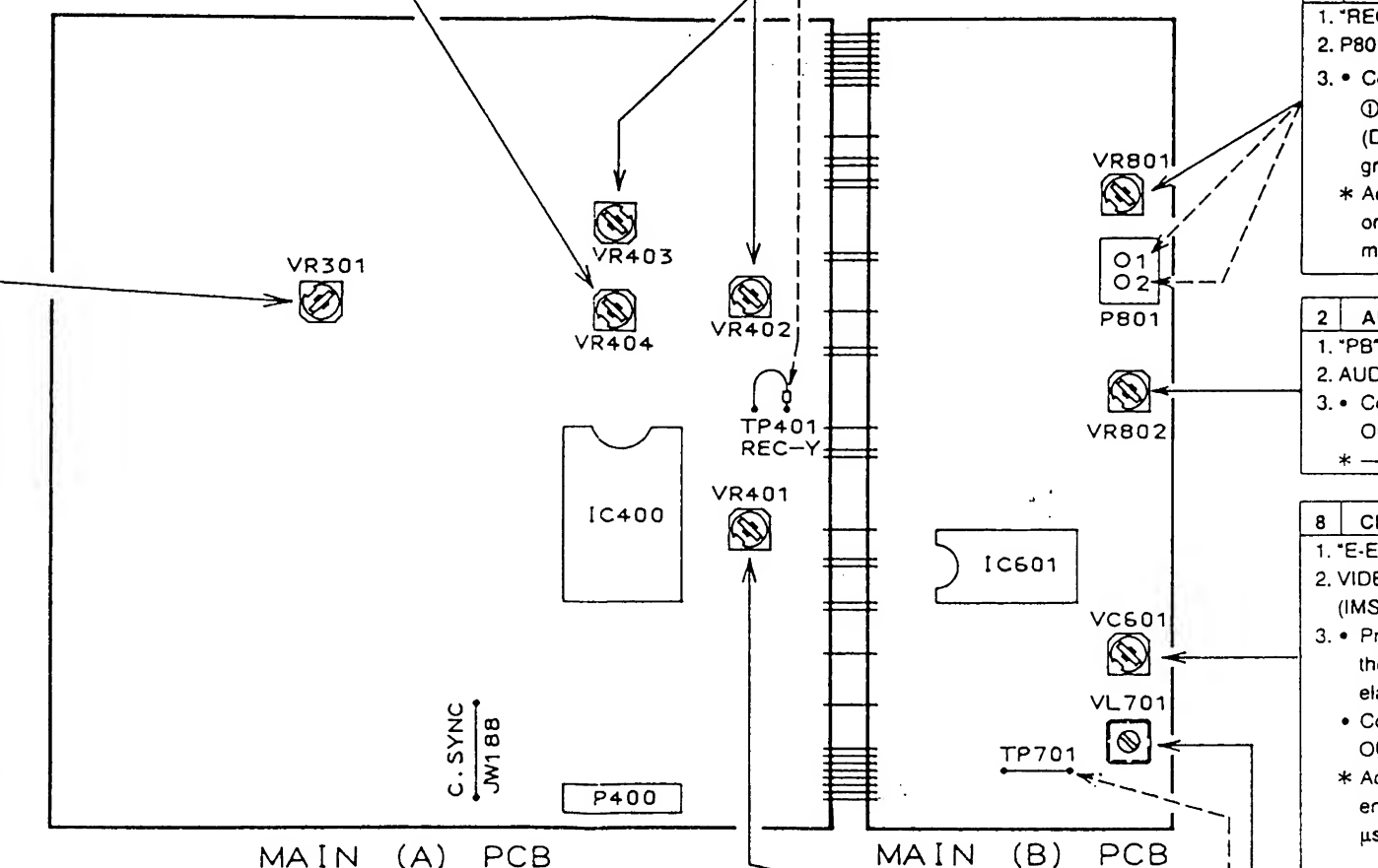
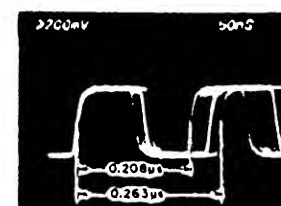
7 VIDEO PB LEVEL

1. "REC", "PB", PAL color bar signal
2. VIDEO OUT & VR404 (PB LEVEL)
3. Connect an oscilloscope to VIDEO OUT
- Make some recording on the tape, then play it back
- * Adjust VR404 so that PB level becomes 1.0 Vp-p



5 CARRIER SET & DEVIATION

1. "REC", PAL color bar signal
2. TP401 (REC.Y) & VR402 (CARRIER), VR403 (DEVIATION)
3. Connect an oscilloscope to TP401 (REC.Y)
- VR402 (CARRIER) : 0.263 µs (3.8 MHz)
- * VR403 (DEVIATION) : 0.208 µs (4.8 MHz)



3 AUDIO REC BIAS

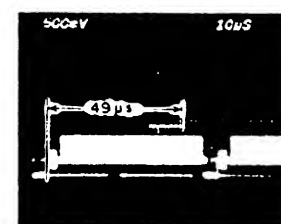
1. "REC", No signal input
2. P801 ① pin, ② pin & VR801
3. Connect an AC voltmeter to P801 ① pin (GND side) and ② pin. (Do not connect the AC voltmeter's ground to the VCR's ground.)
- * Adjust VR801 so that the reading on the AC voltmeter becomes 2.4 mV

2 AUDIO PB LEVEL

1. "PB", test tape TF-527BL
2. AUDIO OUT & VR802
3. Connect AC voltmeter to AUDIO OUT
- * -5 dBs

8 CHARACTER POSITION

1. "E-E" (STOP mode), No signal input
2. VIDEO OUT, TV screen & VC601 (IMS)
3. Press "DISPLAY" button once on the remote control to display elapsed tape counter.
- Connect an oscilloscope to VIDEO OUT
- * Adjust VC601 (IMS) so that right end of the IMS signal becomes 49 µs from the H-SYNC as shown.



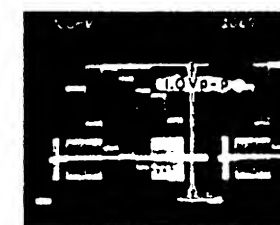
ON THE SCREEN

10 ENV. DET (I-HQ)

- [This adjustment should be performed in the "TEST mode".]
To set the VCR to the TEST MODE, press and hold both the "POWER" and "EJECT" button on the front panel, then plug in the AC power cord. The TEST MODE can be cancelled by disconnecting the AC power cord or simply by pressing the SYSTEM RESET button.
1. Record PAL color bar signal on a normal type blank tape and then play it back.
 2. Observe the number which displayed on the minute part of the FL display.
 3. Adjust the VR3 so that the number displayed on the FL display becomes 88.

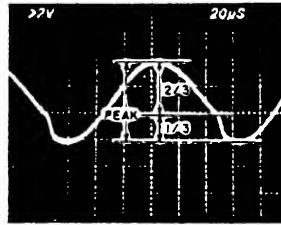
4 VIDEO E-E LEVEL

1. "E-E" (STOP mode), PAL color bar signal
2. VIDEO OUT & VR401 (E-E LEVEL)
3. Connect an oscilloscope to VIDEO OUT
- * 1.0 Vp-p

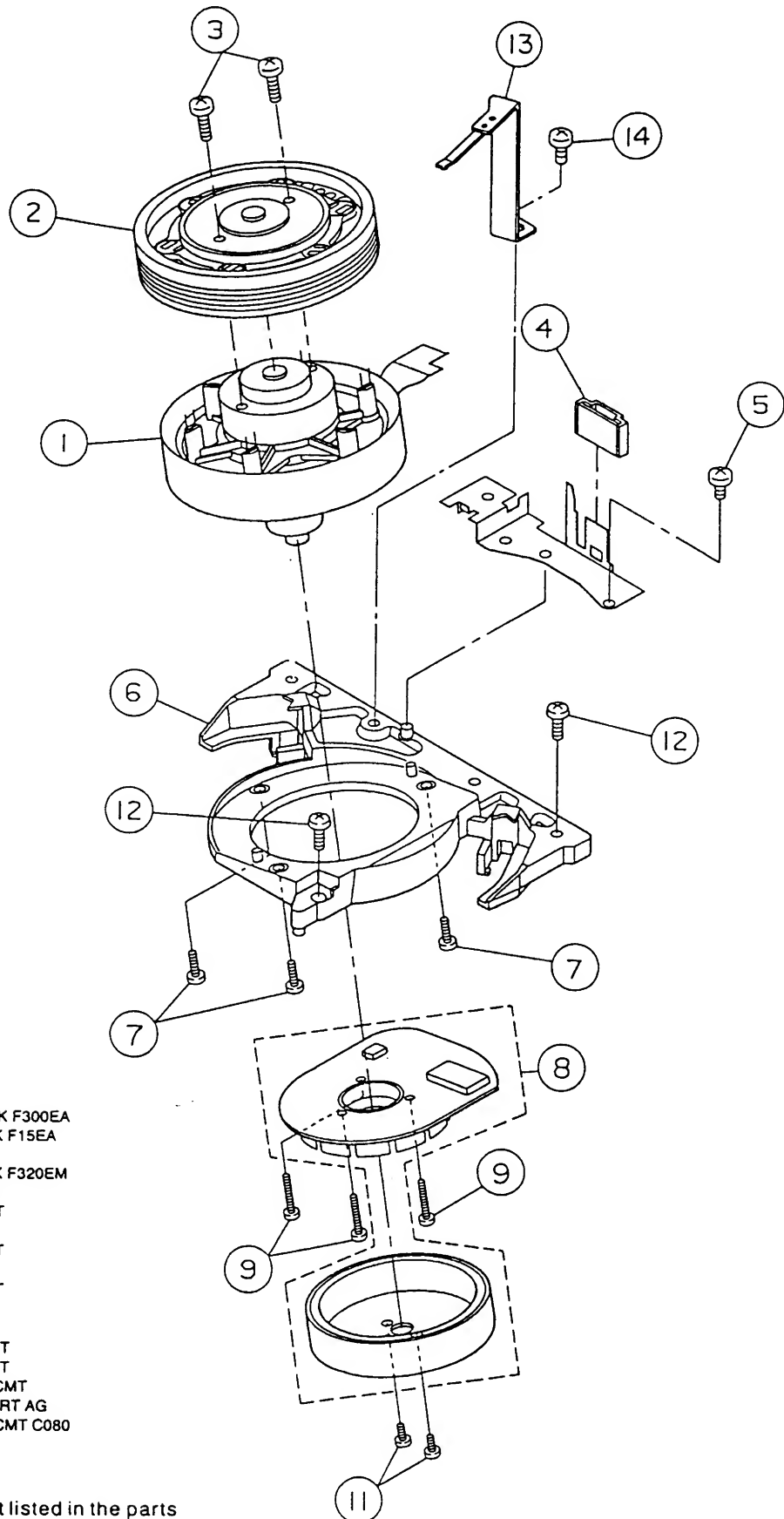


9 P / S AUTO SENSITIVITY (EM ONLY)

1. "E-E" (stop mode), SECAM color bar signal
2. TP701 (P / S SENS), VL701 (P / S SENS)
3. Connect an oscilloscope to TP701 (P / S SENS).
- * Adjust the VL701 so that distorted point of the waveform becomes 1/3 from the bottom as shown.



HEAD DRUM BLOCK



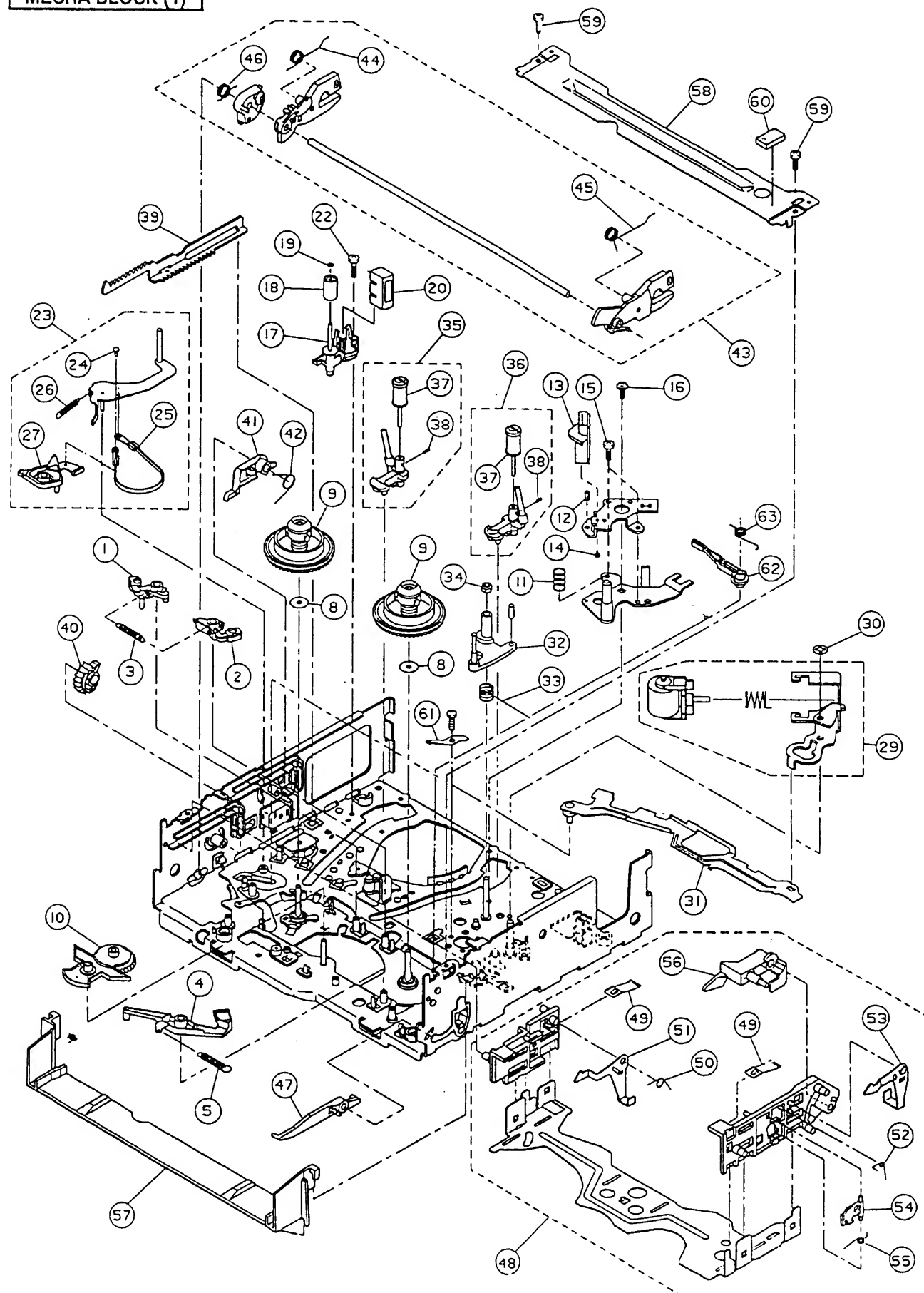
2. HEAD DRUM BLOCK

Ref.No.	Part No.	Description
1	BV-V1123A410D	LOWER DRUM BLK F300EA
2A	BV-V1102A420G	UPPER DRUM BLK F15EA [EXCEPT EM]
2B	BV-V1102A420H	UPPER DRUM BLK F320EM [EM]
3	ZS-321298	BID30X08STL CMT
4	SZ-387388J	HOLDER FPC
5	ZS-379405	BID30X06STL CMT
6	MA-387474J2	BASE DRUM
7	ZS-563444	BID26X08STL CMT
8	BM-401296J	MOTOR E20EL89 [DRUM MOTOR]
9	ZS-467796	PAN26X12STL CMT
11	ZS-379350	PAN30X06STL CMT
12	ZS-336714	ST BID30X12STL CMT
13	VT-401282J	EARTH BRUSH PART AG
14	ZS-389853J	DT BID30X06STL CMT C080

NOTE:

Parts will not be supplied if they are not listed in the parts list, even if they appear on the assembling illustrations with reference No.

MECHA BLOCK (1)



3. MECHA BLOCK (1)

Ref.No.	Part No.	Description
1	ML-387316J	MAIN BRAKE (S) PART
2	ML-387318J	MAIN BRAKE (T) PART
3	ZG-387320J	SP PULL MAIN BRAKE
4	ML-387321J	REVIEW BRAKE PART
5	ZG-387323J	SP PULL REVIEW BRAKE
8	ZW-389814J	PW31X110X050PSL
9	MT-390954J1	DISK (2) PART
10	MI-387294J	IDLER PART
11	ZG-387438J1	SP PUSH A/C
12	ZG-373900	6SET30X080SCM PKR CP
13	HR-405340J	HEAD COMBO HVMZA1121A
14	ZS-404844J	PAN20X02STL BZN PS1
15	ZS-321298	BID30X08STL CMT
16	ZS-389853J	DT BID30X06STL CMT C080
17	MZ-402760J	HOLDER FE HEAD PART B
18	MR-387286J1	ROLLER IMPEDANCE
19	ZW-374445	SLIT W17X032X025PSL
20	HE-390013J	HEAD E HVFME0020A
22	ZS-336714	ST BID30X12STL CMT
23	BL-V1123A050A	TENSION ARM BLK F600EA
24	SZ-387263J2	HOLDER LEVER TENSION
25	ML-390768J1	TENSION BAND PART
26	ZG-395470J	SP PULL TENSION (2)
27	ML-395471J1	TENSION BRAKE PART
29	BL-V1102A160A	ARM PINCH ROLLER (2) BLK 425EA
30	ZW-332843	RETAINING RING GRIP 380STL ACP
31	ML-387431J1	SLIDER PINCH PART
32	ML-387277J3	ARM REVIEW PART
33	ZG-387282J	SP TORSION REVIEW
34	ZW-401776J	NUT REVIEW
35	BV-V1102A070A	LEADER S BLK 425EA
36	BV-V1102A080A	LEADER T BLK 425EA
37	VT-387394J1	GUIDE ROLLER D8 PART
38	ZS-374458	6SET20X030SCM PKR FP
39	ML-387428J	SLIDER FRONT LOADING
40	MZ-387335J	GEAR EJECT
41	ML-391745J2	ARM DAMPER
42	ZG-395567J	SP TORSION ARM DAMPER
43	BL-V1102A140A	ARM LOADING BLK 425EA
44	ZG-387417J	SP TORSION LOAD (S)
45	ZG-387418J	SP TORSION LOAD (T)
46	ZG-392831J	SP TORSION JOINT (2)
47	ML-387350J1	ARM LID OPENER
48	BV-V1102A150A	CASSETTE LOAD BLK 425EA
49	ZG-387348J1	SP PLATE HOLDER
50	ZG-387421J	SP TORSION DAMPER (S)
51	ML-387345J	LEVER DAMPER (S)
52	ZG-388290J1	SP TORSION DAMPER (T)
53	ML-387346J	LEVER DAMPER (T)
54	ML-387344J	LEVER LOCK RELEASE
55	ZG-387420J	SP TORSION RELEASE
56	ML-387349J2	ARM SHUTTER
57	SE-395554J	GUIDE FRONT (2)
58	MZ-387351J1	PLATE UPPER
59	ZS-358936	ST BID30X06STL CMT
60	SZ-391866J1	CUSHION COVER
61	ZG-392294J	SP PLATE EARTH
62	MZ-404539J	REW BRAKE PART
63	ZG-404541J	SP TORSION REW BRAKE
63	BB-V1130A020B	MECHA DECK BLK F300EA

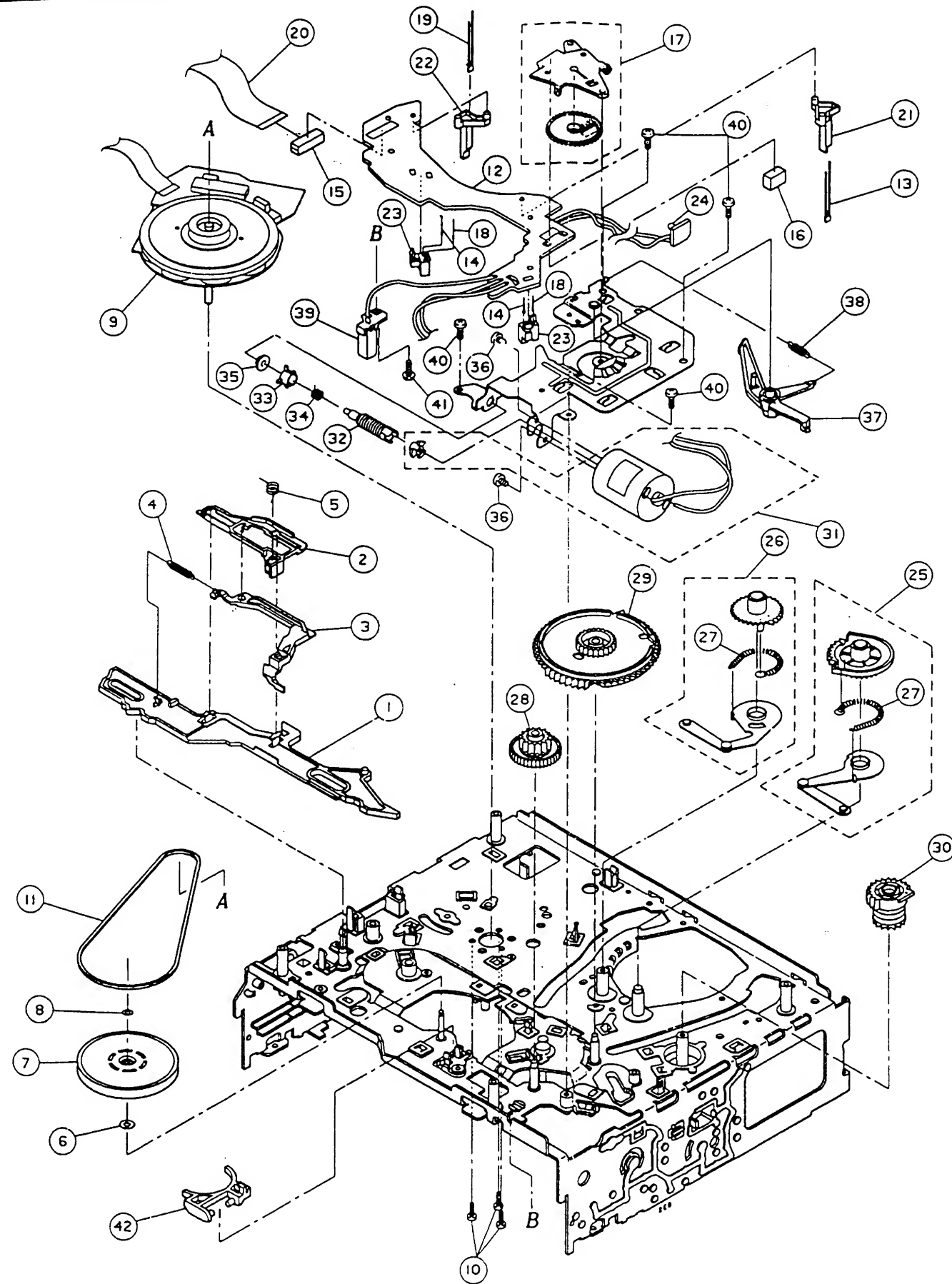
NOTE:

Parts will not be supplied if they are not listed in the parts list, even if they appear on the assembling illustrations with reference No.

4. MECHA BLOCK (2)

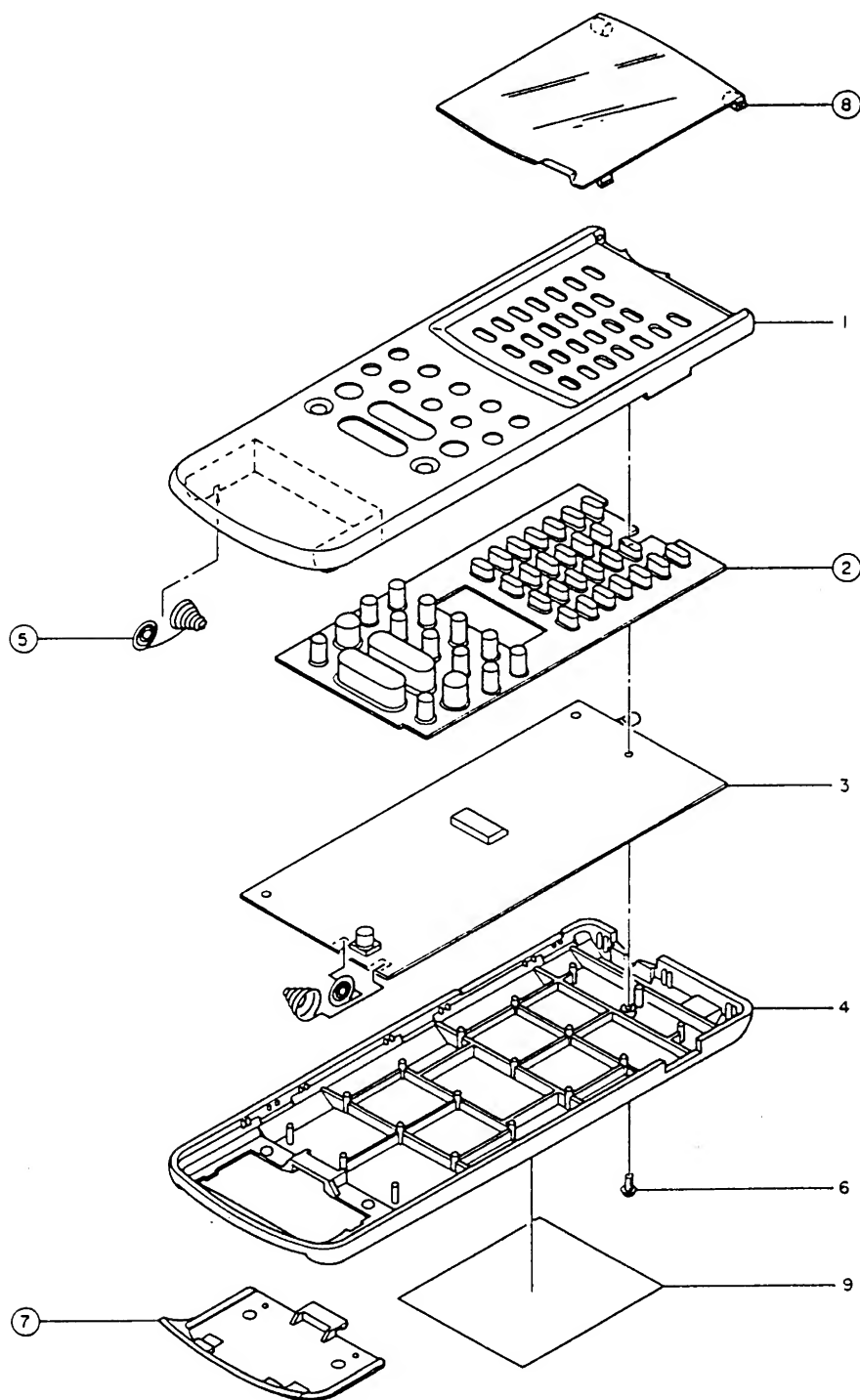
MECHA BLOCK (2)

Ref.No.	Part No.	Description
1	ML-396018J	SLIDER BRAKE (2) PART
2	ML-404944J	SLIDER TRIGGER (2)
3	ML-387402J1	LEVER TRIGGER
4	ZG-387468J	SP PULL SLIDER
5	ZG-387403J	SP TORSION COUPLING
6	ZW-389923J	PW26X060X050PSL
7	MZ-387298J3	DISK CLUTCH PART
8	ZW-387492J	SLIT W21X040X050PSL
9	BM-400682J1	MOTOR DFX-67B3VWB1 [CAPSTAN MOTOR]
10	ZS-365149	PT BID26X06STL CMT
11	MB-387289J	BELT CAPSTAN
12	EA-387496J	PC (#) SENSOR
13	ED-390011J	D LED GL451 INFRARED [D1]
14	ED-390012J	D LED GL4800 INFRARED [D2][D3]
15	EJ-387497J	SOCKET HOUSING 5062-30-10-13 [PS1]
16	EJ-381837J	SOCKET 174074-5 5P [P1]
17	ES-387465J	SW MODE SELECT MMS00070ZLBO [SW1]
18	ET-390010J	TR PHOTO PT4800 [TR2][TR3]
19	ET-390009J	TR PHOTO PT493F [TR4]
20	EW-389313J	CORD FFC P1.25 L=120 13P [WP1]
21	MZ-387430J	HOLDER D-LED
22	MZ-387445J	HOLDER S SENSOR
23	MZ-387446J	HOLDER PHOTO SENSOR
24	ET-361490	TR PHOTO PN268 [TR1]
25	MZ-V1102A090A	GEAR TOGGLE (S) BLK 425EA
26	MZ-V1102A100A	GEAR TOGGLE (T) BLK 425EA
27	ZG-387413J1	SP PULL TOGGLE
28	MZ-387332J	GEAR WORM WHEEL
29	MZ-396021J	GEAR CAM SLIDER (2)
30	MZ-387333J	GEAR FRONT LOADING
31	BM-387503J	MOTOR PART [LOADING MOTOR]
32	MZ-401686J	GEAR WORM (2)
33	MR-391968J	PULLEY TRIGGER (2)
34	ZG-387443J	SP TRIGGER
35	MR-404544J	HOLDER THRUST WORM (2)
36	ZS-425981	BID30X03STL CMT
37	BL-387458J2	CAPSTAN BRAKE PART
38	ZG-387502J	SP PULL CAPSTAN BRAKE
39	ES-373099	SW LEAF MTS10110MPC1
40	ZS-389950J	PT BID26X10STL CMT
41	ZS-358936	ST BID30X06STL CMT
42	ML-387311J2	ARM COUPLING



NOTE:
Parts will not be supplied if they are not listed in the parts list, even if they appear on the assembling illustrations with reference No.

REMOCON RC-V200E/V300E



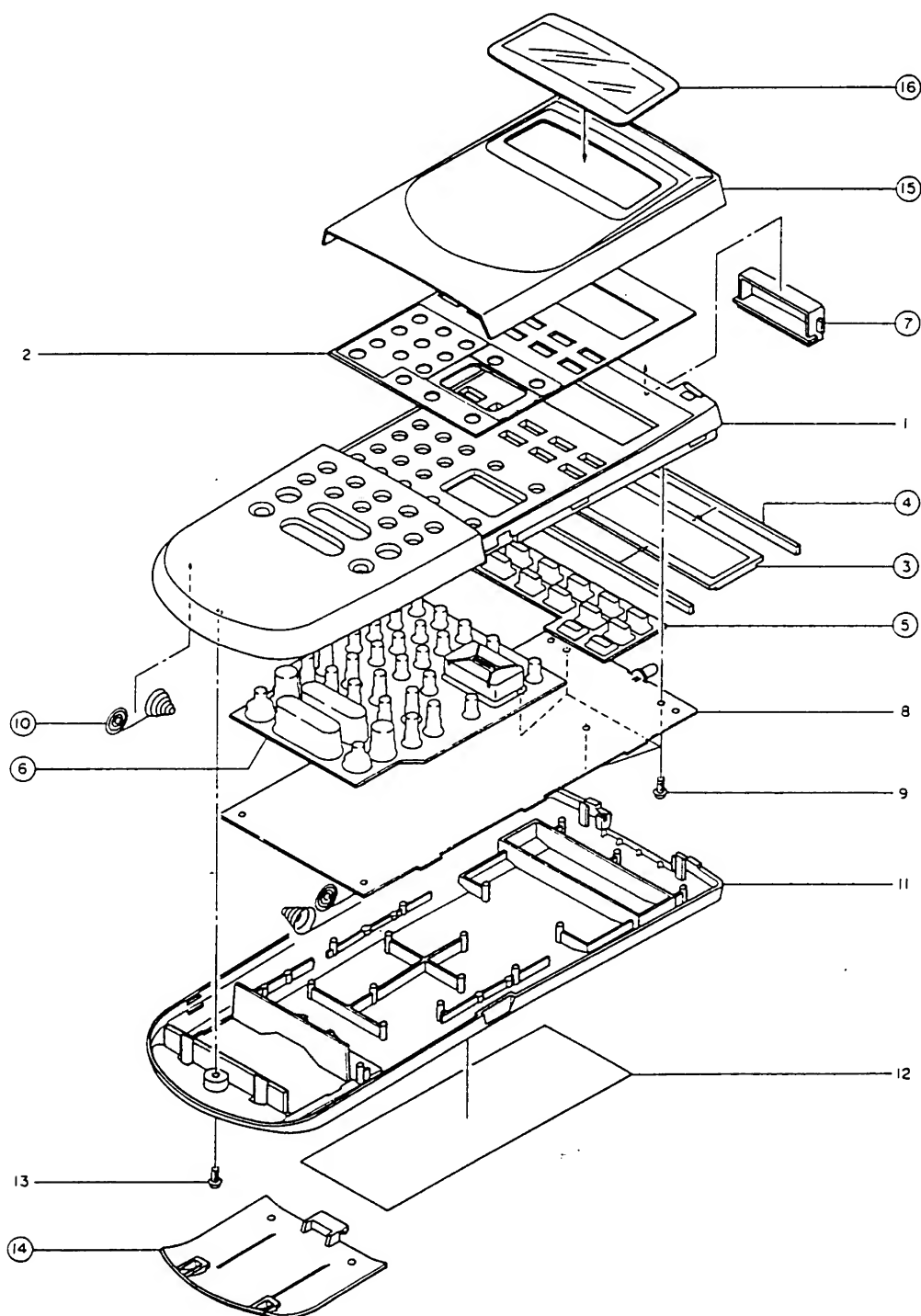
18. REMOCON RC-V200E/V300E

Ref.No.	Part No.	Description
2	MB-402705J	KEY RUBBER
5	ZG-394389J	TERMINAL BATTERY (Q3)
7	SC-394382J	COVER BATTERY (N)-2
8	SP-394383J1	DOOR PANEL

19. REMOCON P.C BOARD RC-V200E/V300E

Ref.No.	Part No.	Description
D1	ED-390686J	D LED TLN1058 INFRARED
D2	ED-386031J	D SILICON CHIP MA110-TW
D3	ED-386031J	D SILICON CHIP MA110-TW
D4	ED-386031J	D SILICON CHIP MA110-TW
IC1	EI-376112	IC UPD6122G
TR1	ET-390826J	TR.CHIP 2SD1619 T,U TC T08
X1	EI-390687J	OSC CE CSU455PL 455KHZ
1	ZG-402706J	TERMINAL BATTERY (U1)
2	ZG-402685J	TERMINAL BATTERY (U2)

REMOCON RC-V302E



20. REMOCON RC-V302E

Ref.No.	Part No.	Description
3	EM-403448J	IND LCD LF5381G ENGLISH
4	EJ-403095J	TERMINAL LCD (3) B1024
5	MB-403107J	KEY RUBBER (S2)
6	MB-403125J	KEY RUBBER (L)
7	SE-403111J	FILTER
10	ZG-403100J	TERMINAL BATTERY (+)
14	SC-403133J	COVER BATTERY
15	SP-403126J1	DOOR PANEL (L)
16	SP-403096J	WINDOW LCD

21. REMOCON P.C BOARD RC-V302E

Ref.No.	Part No.	Description
D1	ED-403450J	D LED SE303ARF-C INFRARED
IC1	EI-405245J	IC M50933-123FP HKHREM3
IC2	EI-400672J	IC S-8052ALB-LE
TR1	ET-390826J	TR.CHIP 2SD1619 T,U TC T08
X1	EI-368825	OSC X'TAL MX-38T 32.768KHZ
X2	EI-403451J	OSC CE CSB1200J 1.200MHZ
1	ZG-403098J	TERMINAL BATTERY (+)
2	ZG-403099J	TERMINAL BATTERY (-)

AKAI

MODEL **VS-F300**_{EA/EOH}

MODEL **VS-F310**_{EK/EOH}

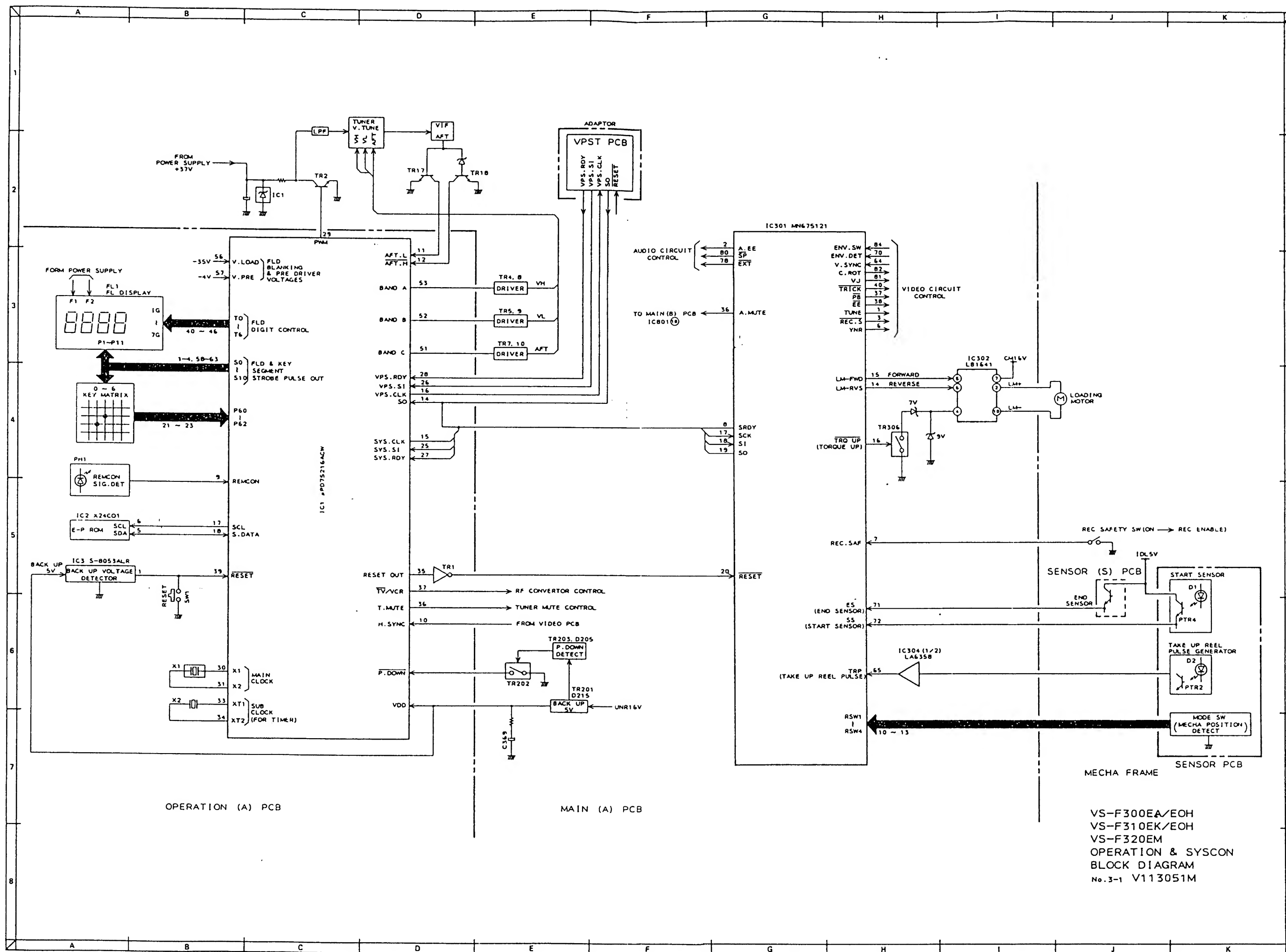
MODEL **VS-F320**_{EM}

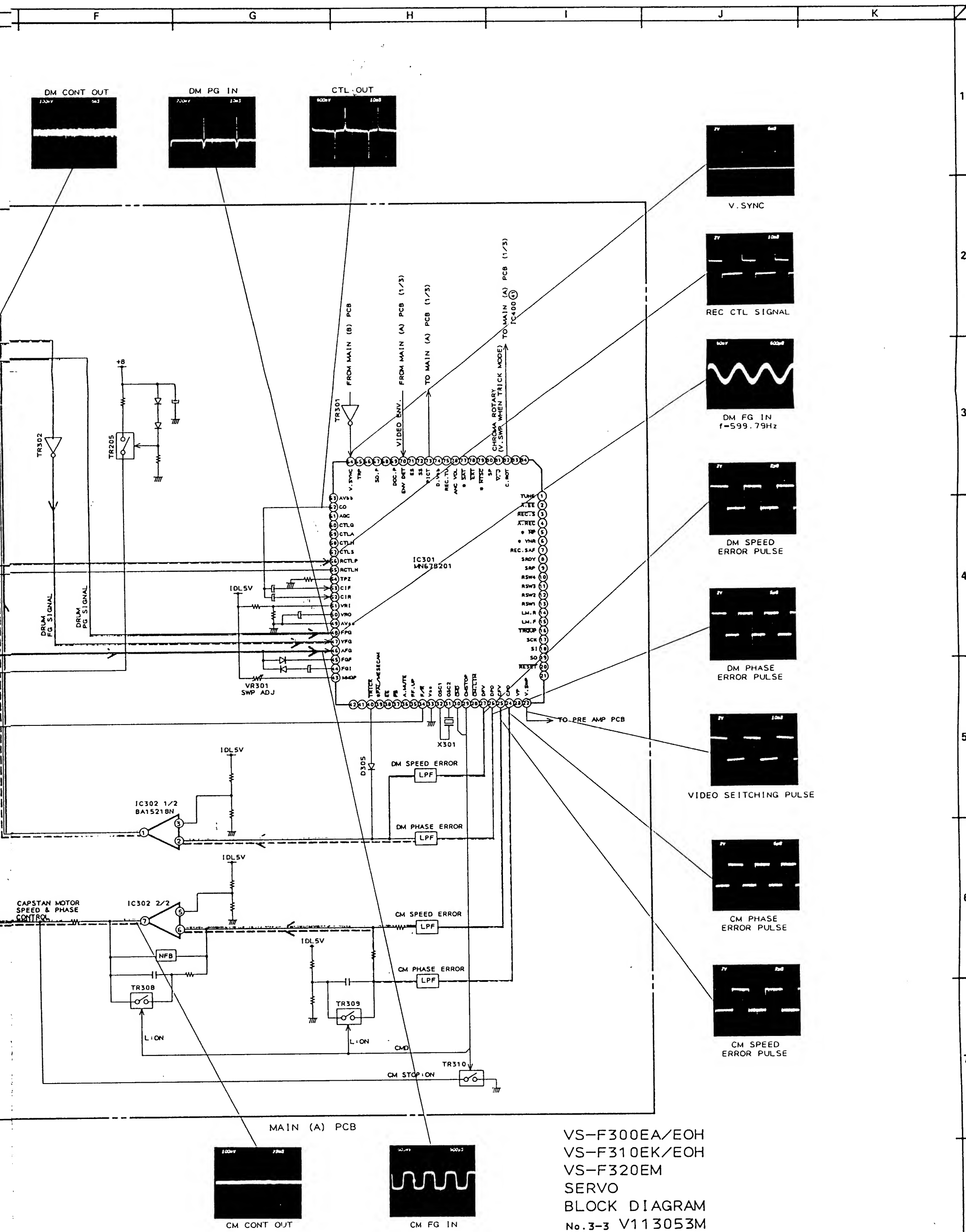
SCHEMATIC DIAGRAMS AND PC BOARDS

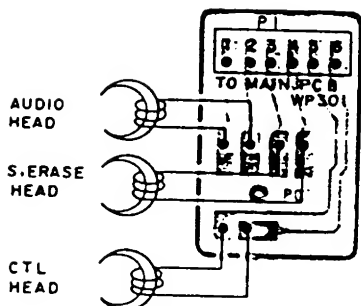
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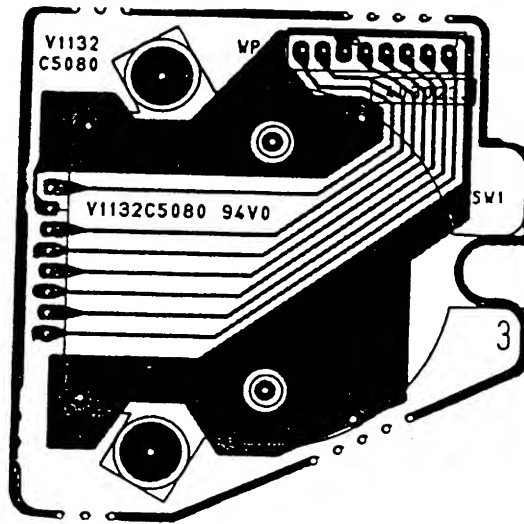
Use the following schematic diagrams and PC boards together with the provided service manual.



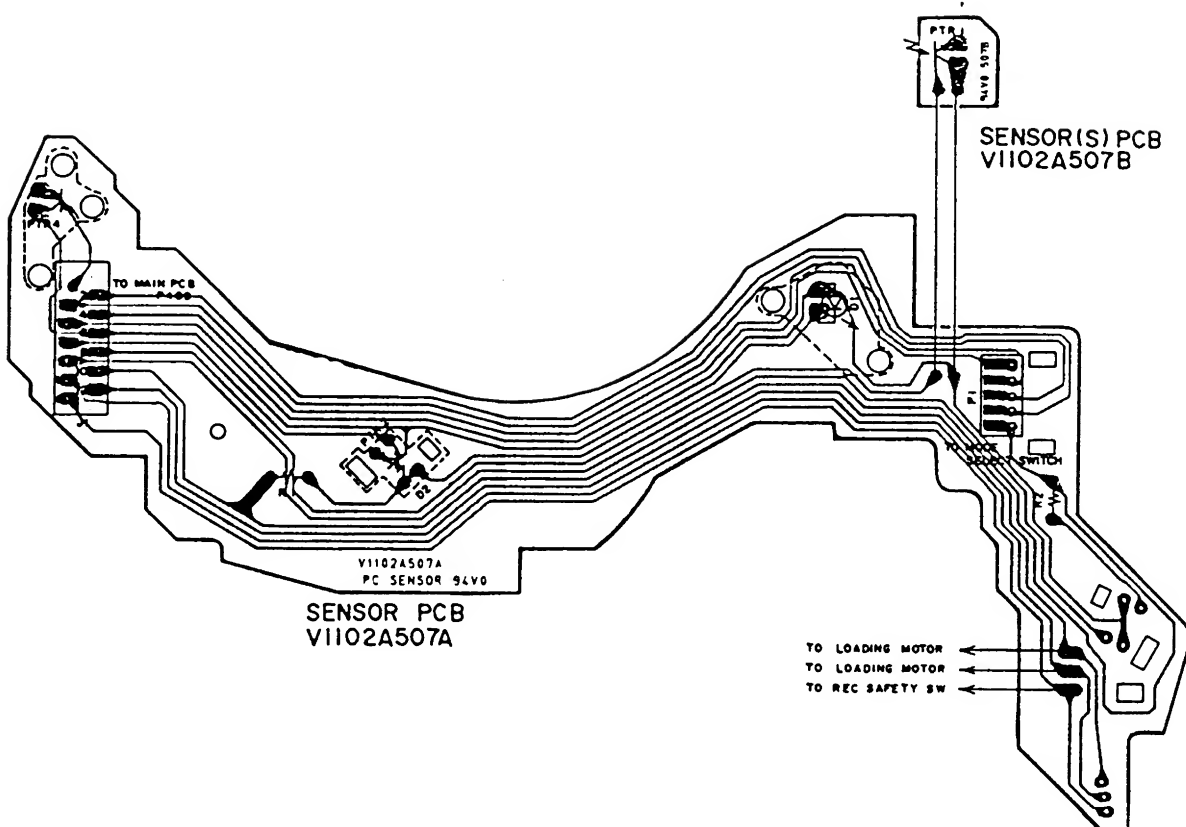




A/C HEAD PCB
V1102B5120J1

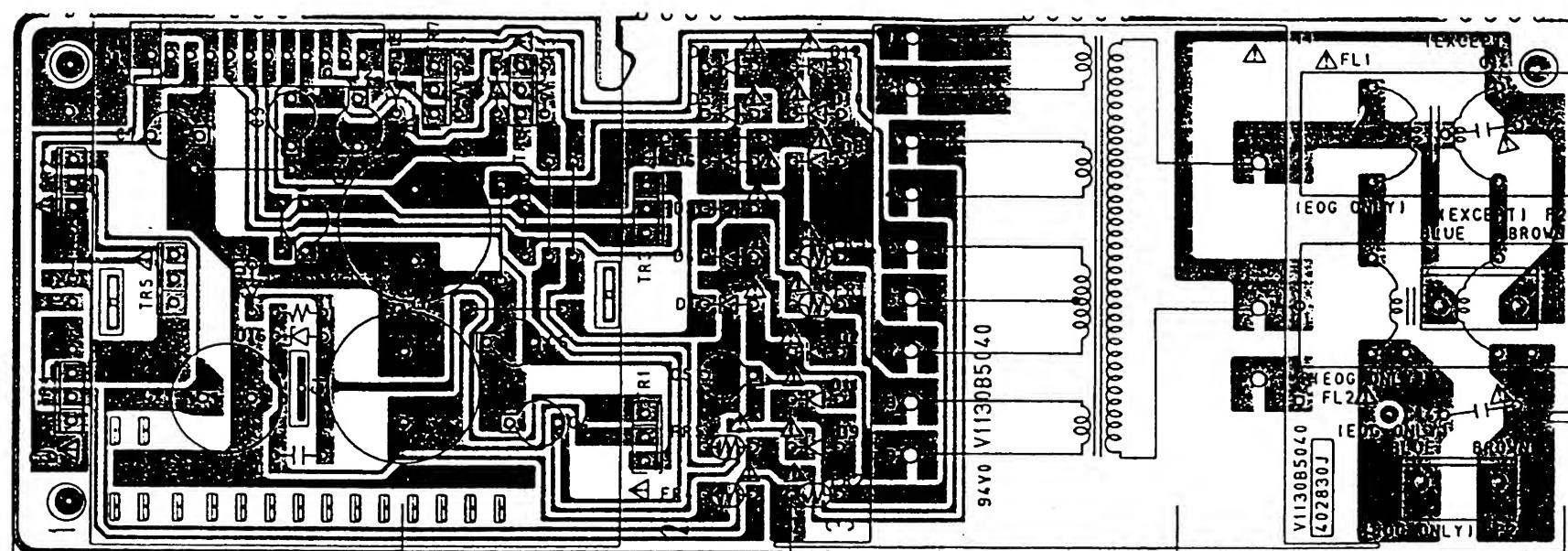


JOG SHUTTLE PCB V1132C5080



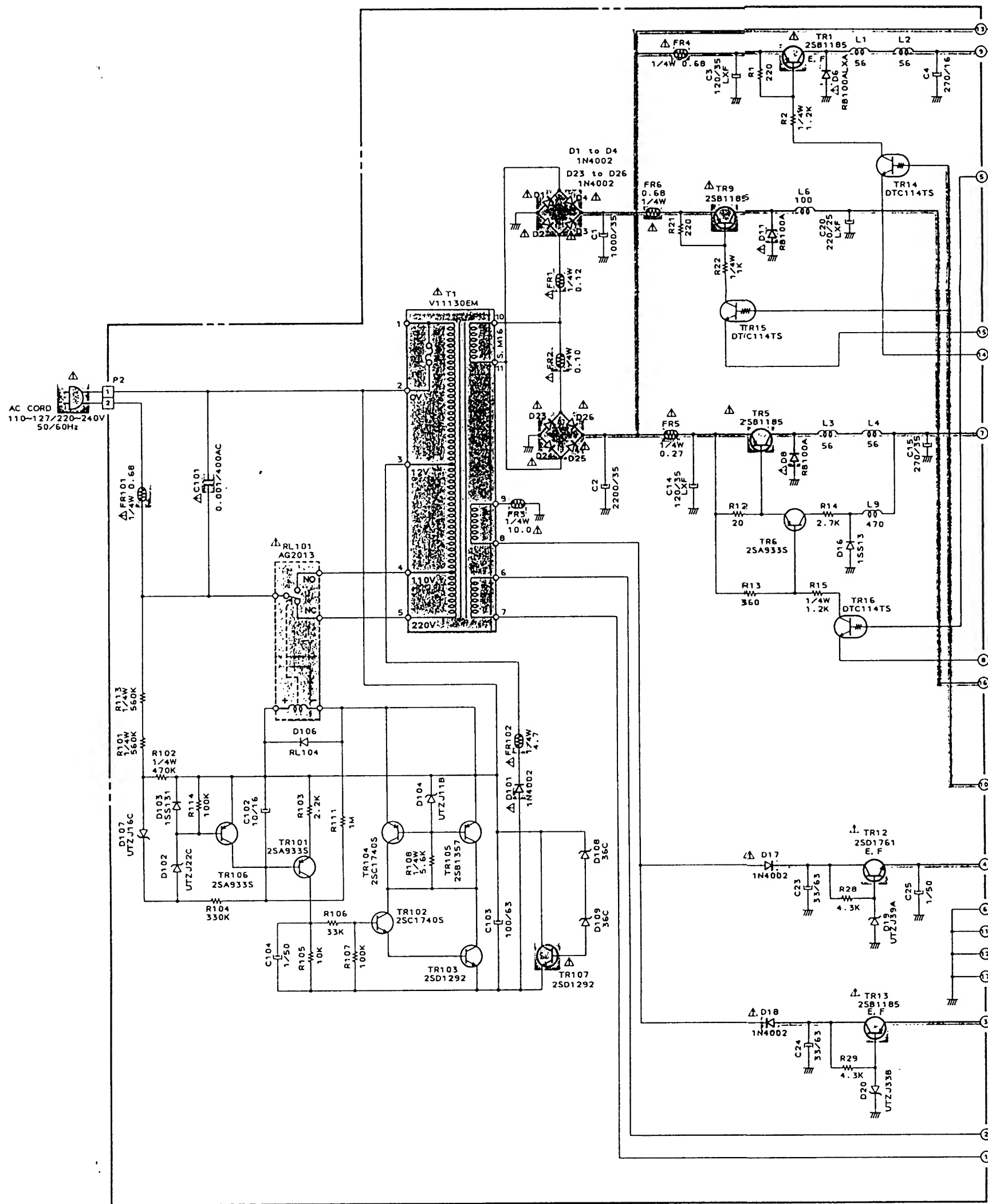


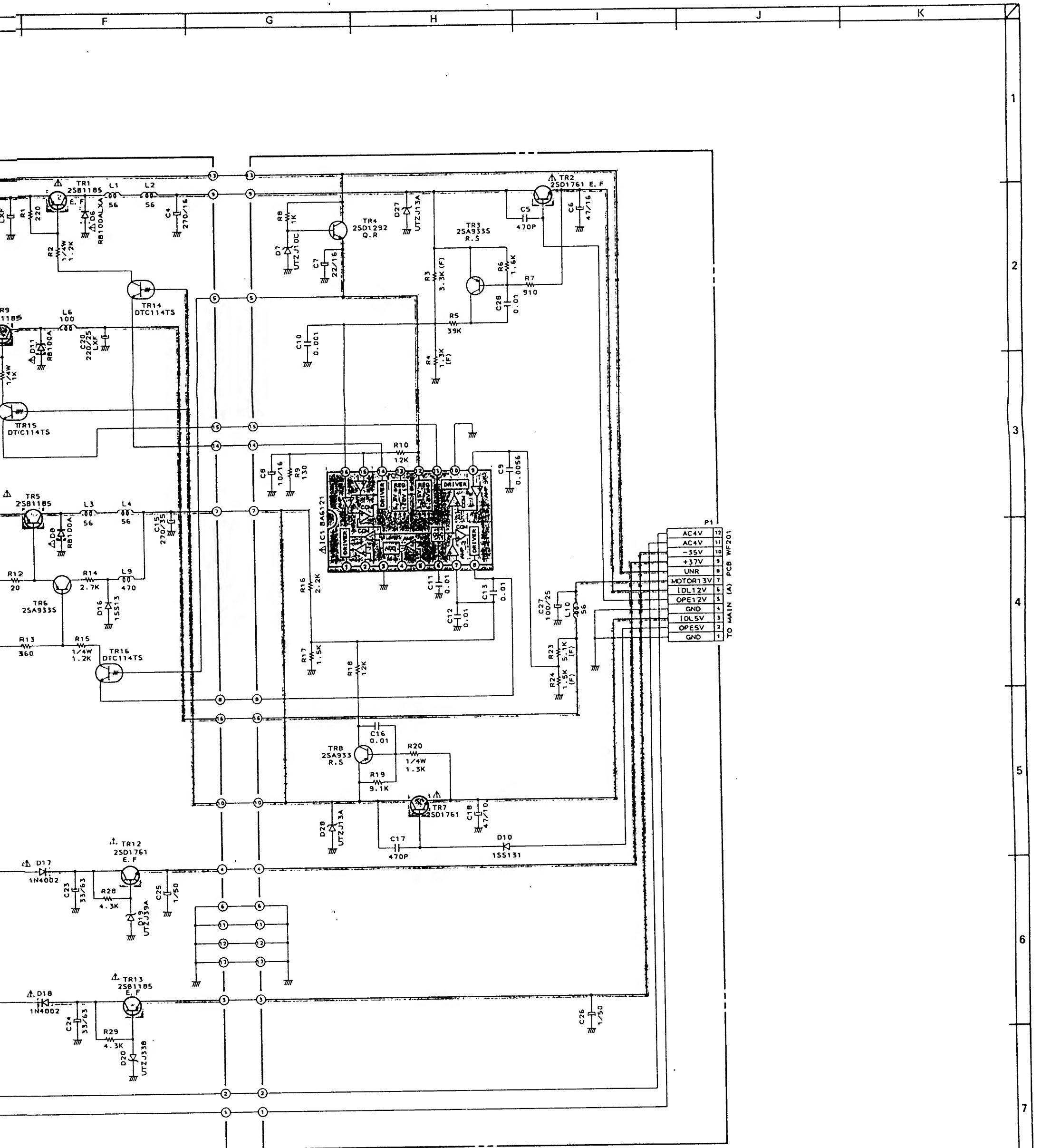
VS-F300EA/EOH
VS-F310EK/EOH
POWER SUPPLY
No.13-2 V113008M



POWER SUPPLY PCB VII30B5040

WARNING: Δ INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY.
REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S
RECOMMENDED PARTS
AVERTISSEMENT: Δ IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ.
POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL,
NE REMPLACER QUE DES PIÈCES RECOMMANDÉES PAR LE FABRICANT





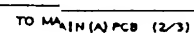
POWER SUPPLY (2) PCB V1130A506B

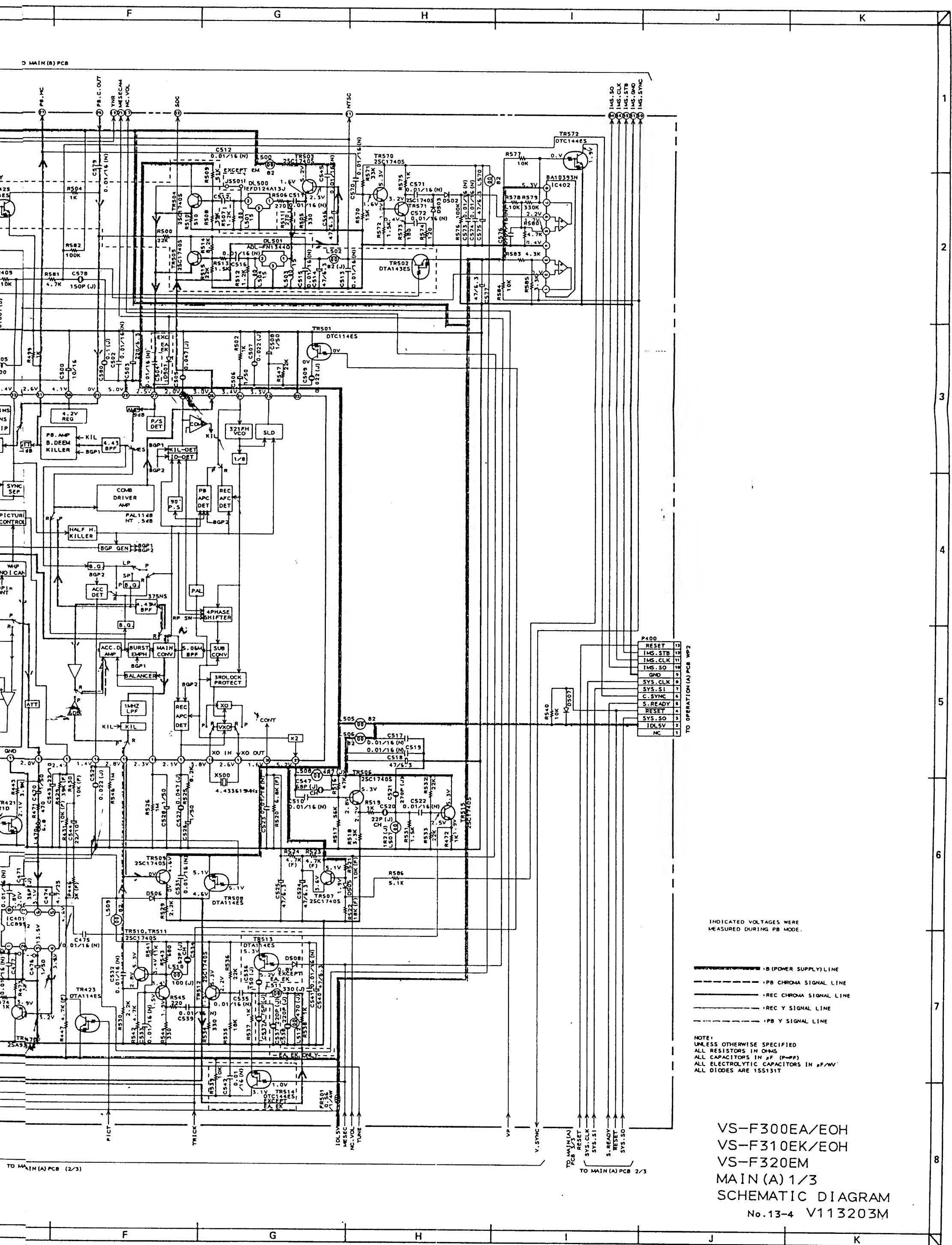
WARNING: Δ AND ∇ INDICATE SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY. REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS.

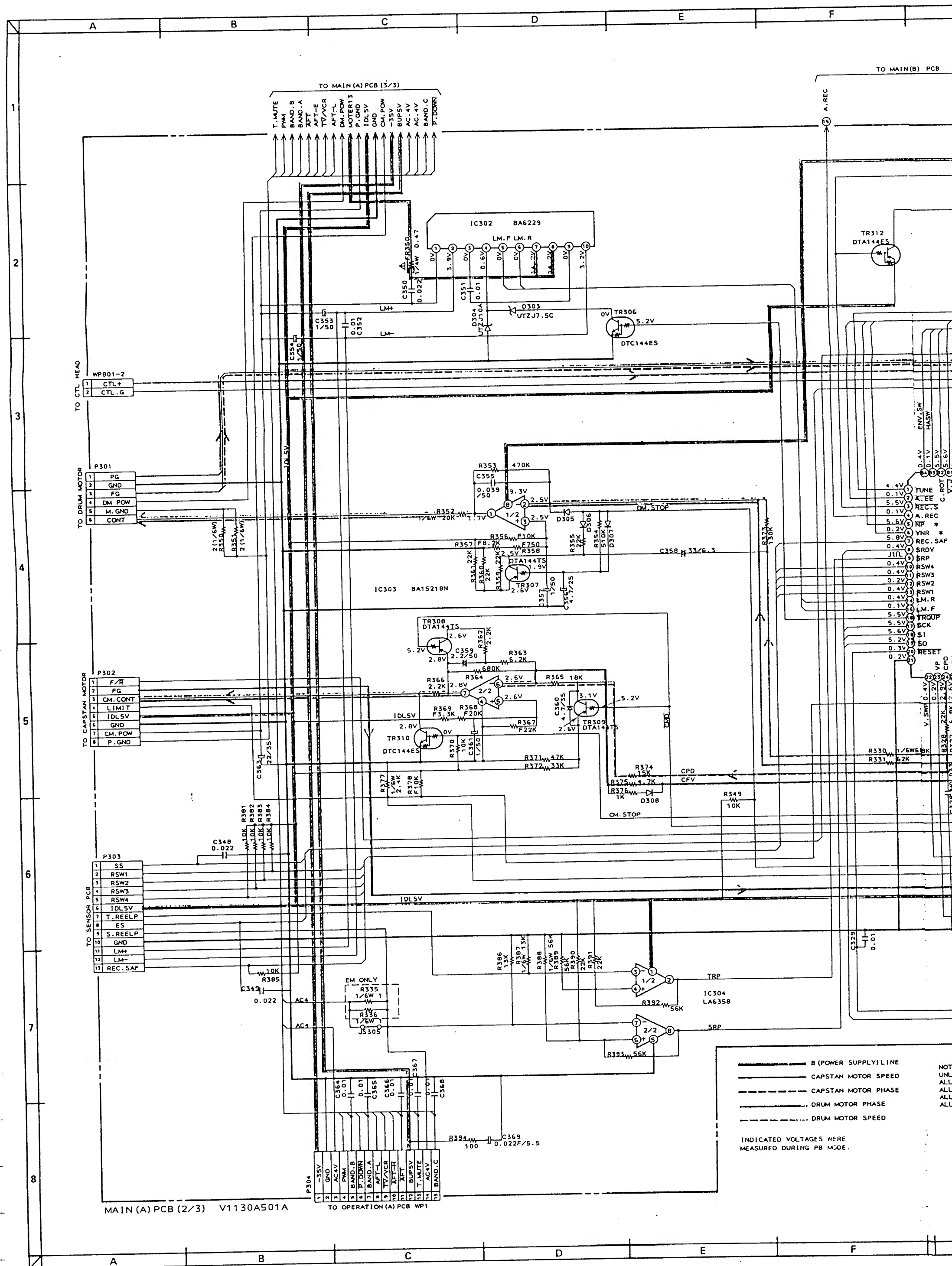
AVERTISSEMENT: Δ ET ∇ ILS INDIQUENT LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDÉES PAR LE FABRICANT.

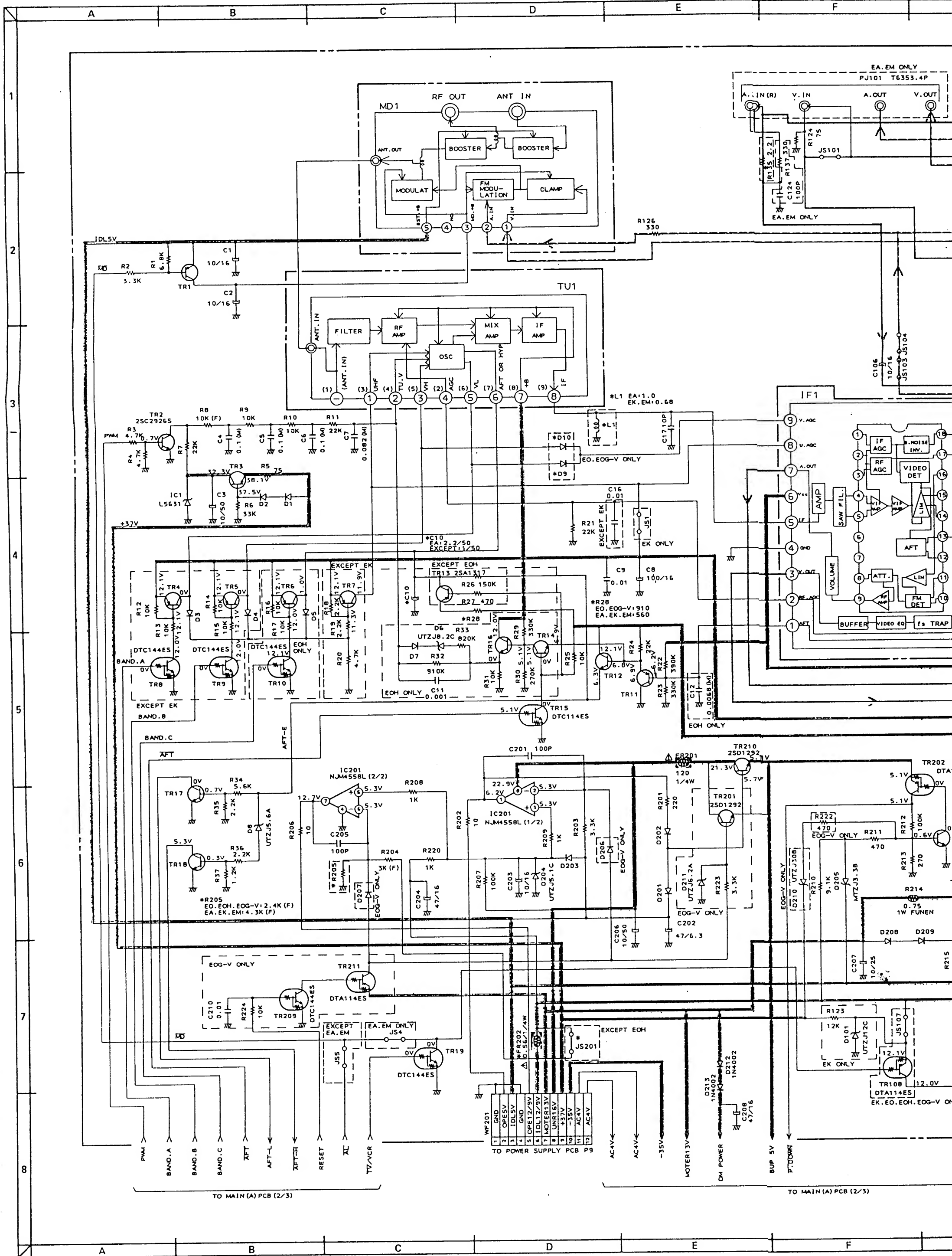
NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/6W(J)
ALL CAPACITORS IN μ F 50 WV(M)
ALL INDUCTORS IN μ H(K)

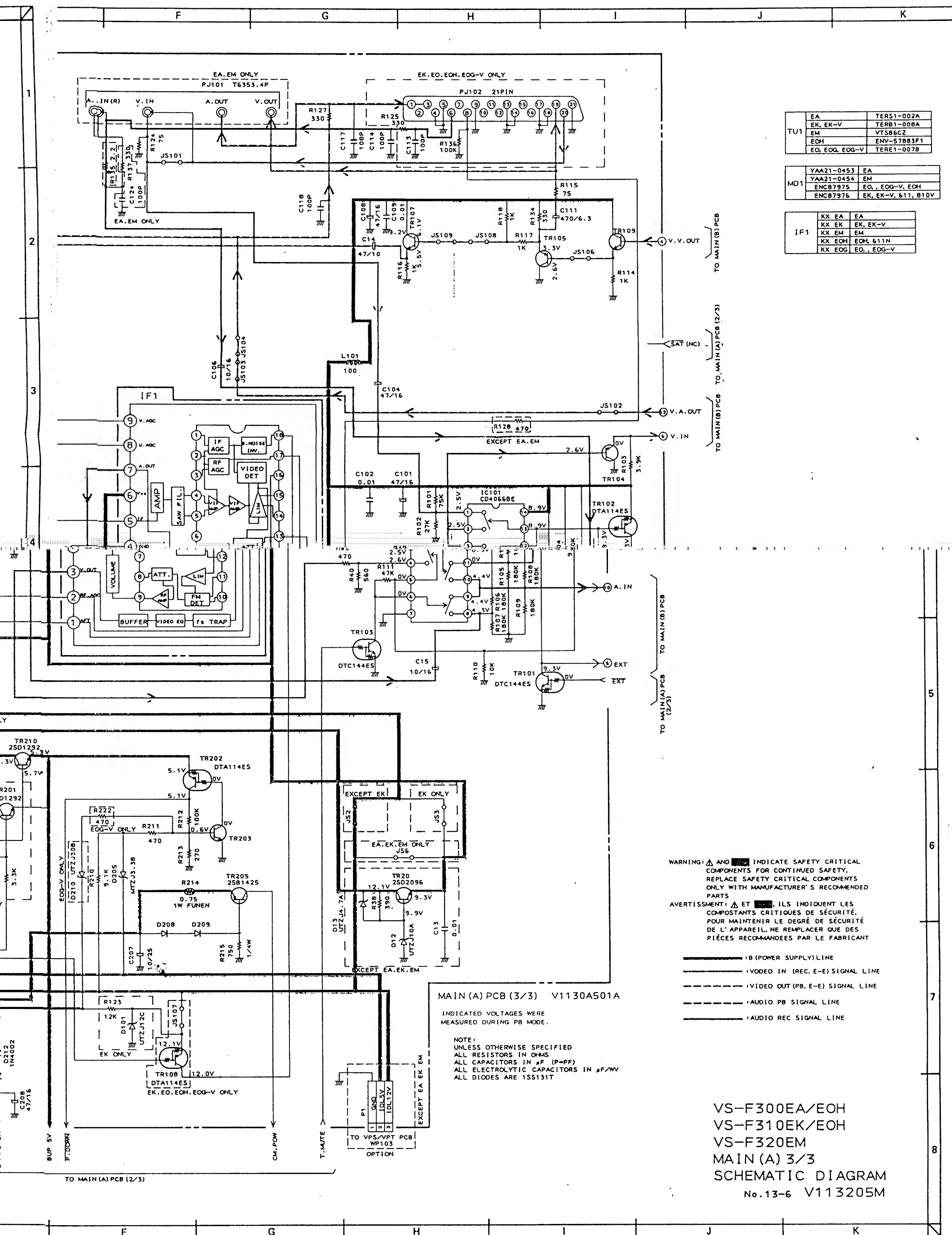
VS-F320EM
POWER SUPPLY (1), (2)
SCHEMATIC DIAGRAM
No.13-3 V113003M











PRINCIPAL PARTS LOCATION

ICS

IC101	D5	TR108	D4
IC201	F4,5	TR109	C6
IC301	E1,2	TR201	F4
IC302	F1,2	TR202	E4
IC303	E,F3	TR203	E4
IC304	F2	TR205	E,F4
IC400	C3	TR210	E,F4
IC401	C,D4	TR301	D1
IC402	C,D1	TR302	E3
IC403	B,C5	TR303	D,E2

WF

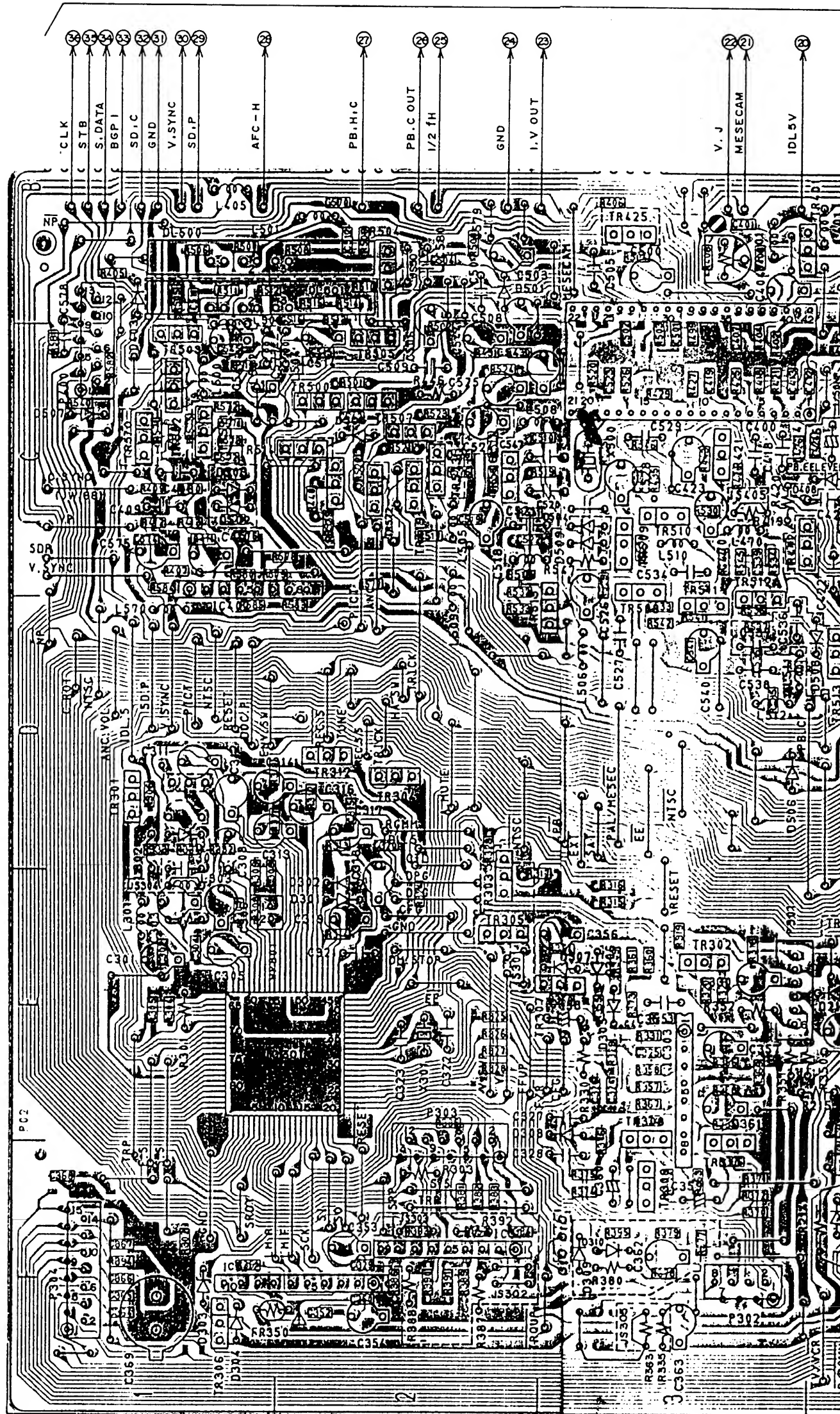
WF201	F4,5
-------	------

CONNECTORS

P1	E,F5
P301	E3
P302	E3
P303	E2
P304	F1
P400	B,C1
P401	D5

TRANSISTORS

TR1	F6	TR414	D4
TR2	F6	TR415	C4
TR3	F5	TR417	C5
TR4	F5	TR421	C3
TR5	F5	TR423	C2
TR6	F5	TR425	B3
TR7	E5	TR470	D4
TR8	F5	TR471	C4
TR9	F5	TR501	C2
TR10	E,F5	TR502	C1
TR11	E5	TR503	C1
TR12	E5	TR504	C1
TR13	E,F5	TR505	C2
TR14	F5	TR506	C2
TR15	F5	TR507	C2
TR16	F5	TR508	C,D3
TR17	F4	TR509	C3
TR18	F4	TR510	C3
TR19	E4	TR511	D3
TR20	E5	TR512	C,D3
TR101	D5	TR513	D4
TR102	D5	TR514	C2
TR103	E5	TR515	C2
TR104	E5	TR570	C1
TR105	D6	TR571	C1
TR107	D6	TR572	C2

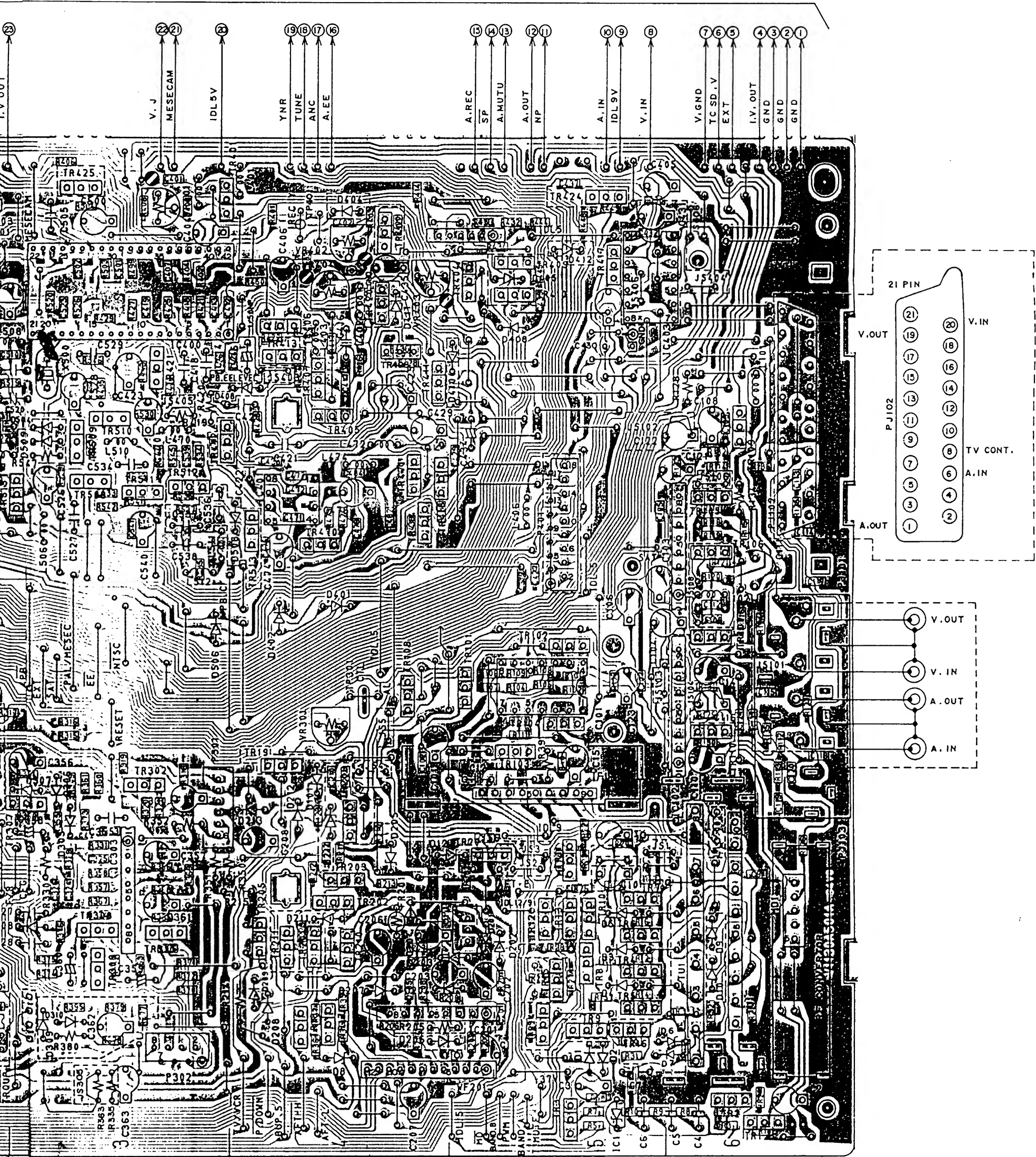


MAIN (A) PCB

WARNING: Δ INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY.
REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S
RECOMMENDED PARTS

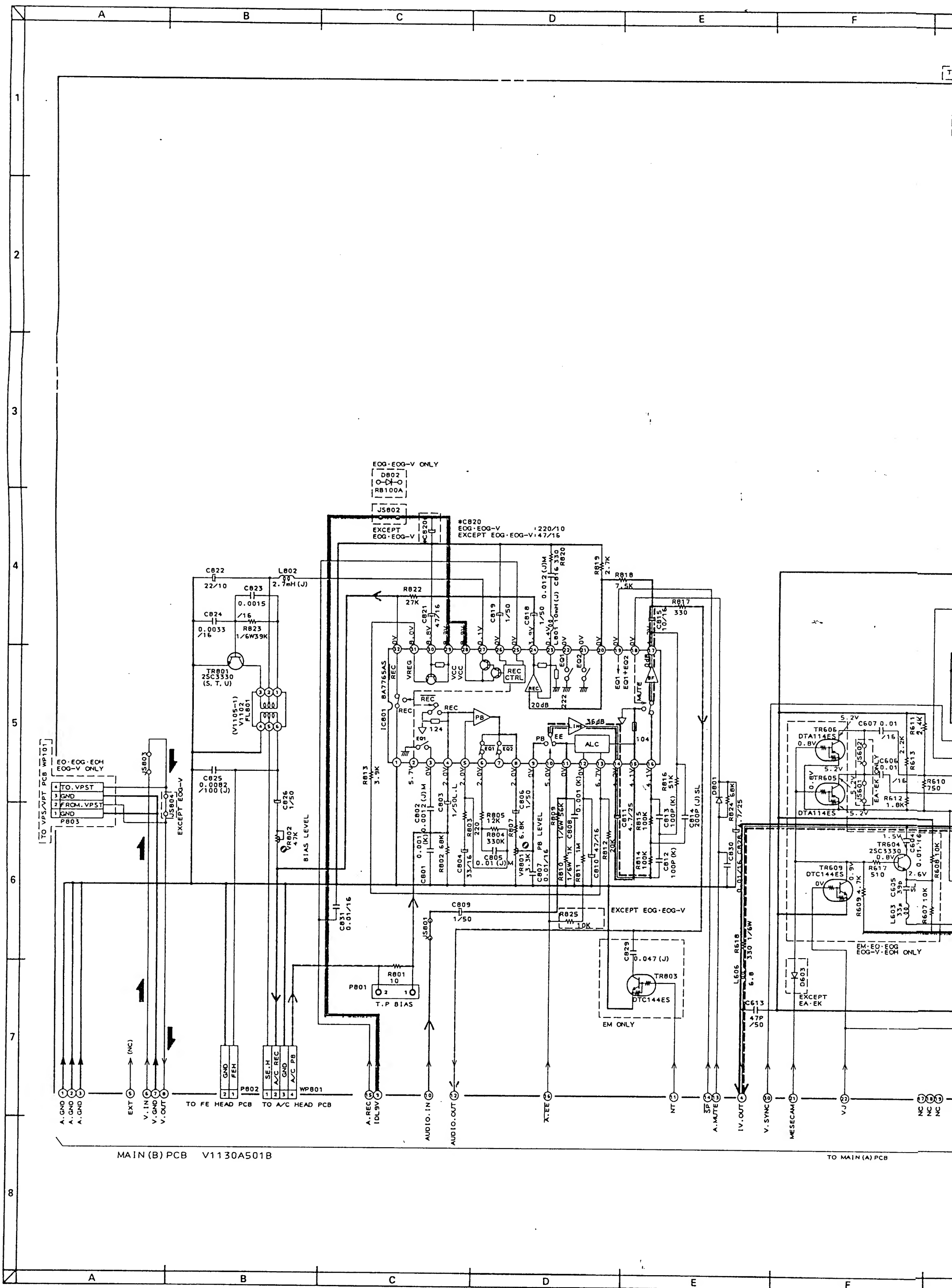
AVERTISSEMENT: Δ IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ
POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL.
NE REMPLACER QUE DES PIÈCES RECOMMANDÉES PAR LE FABRICANT

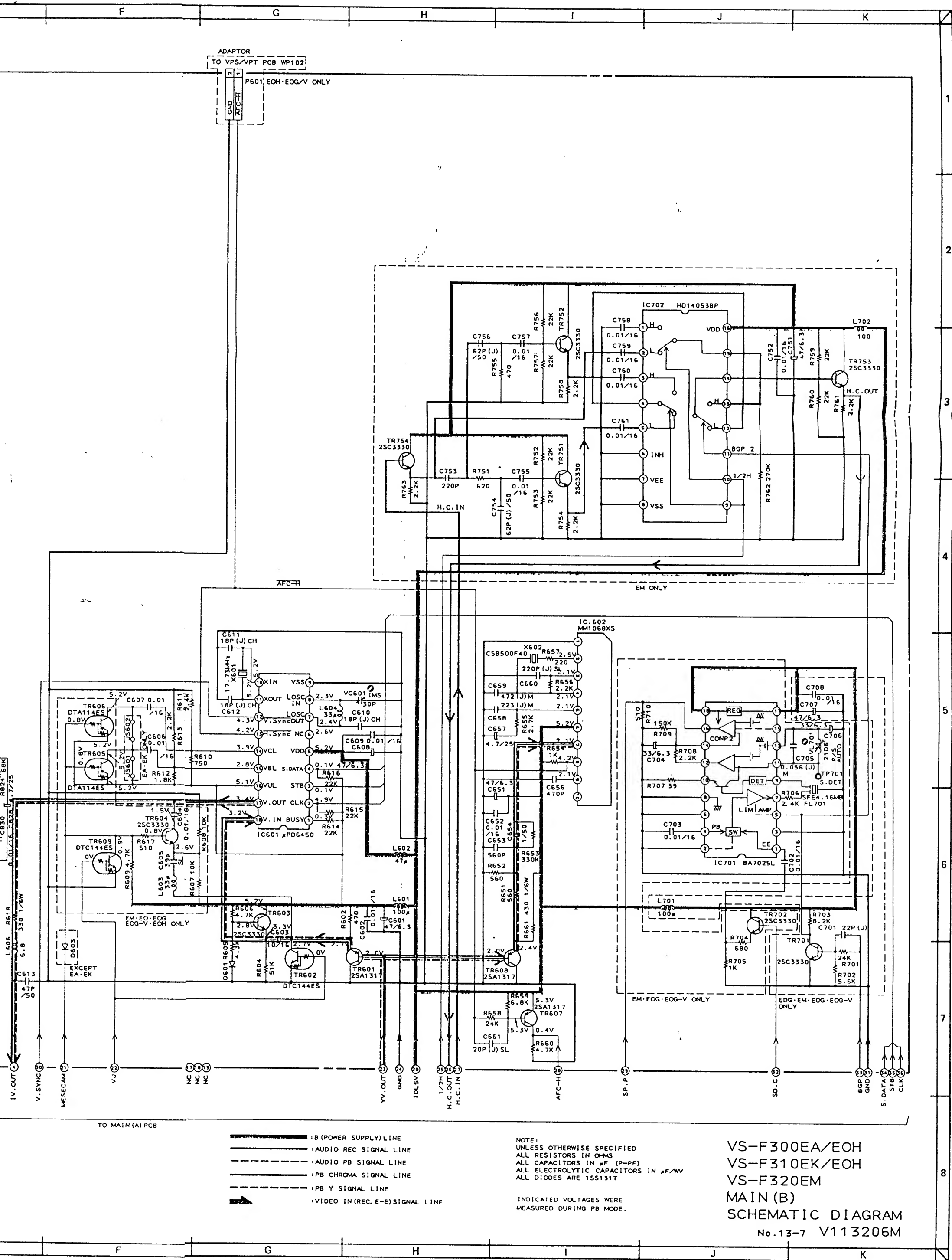
TO MAIN (B) PCB



MAIN (A) PCB VII30A50IAJ1

NOTE : PARTS DIFFER DEPENDING ON MODEL NUMBER.
REFER TO SCHEMATIC DIAGRAMS FOR PARTAINING
PARTS INFORMATION.





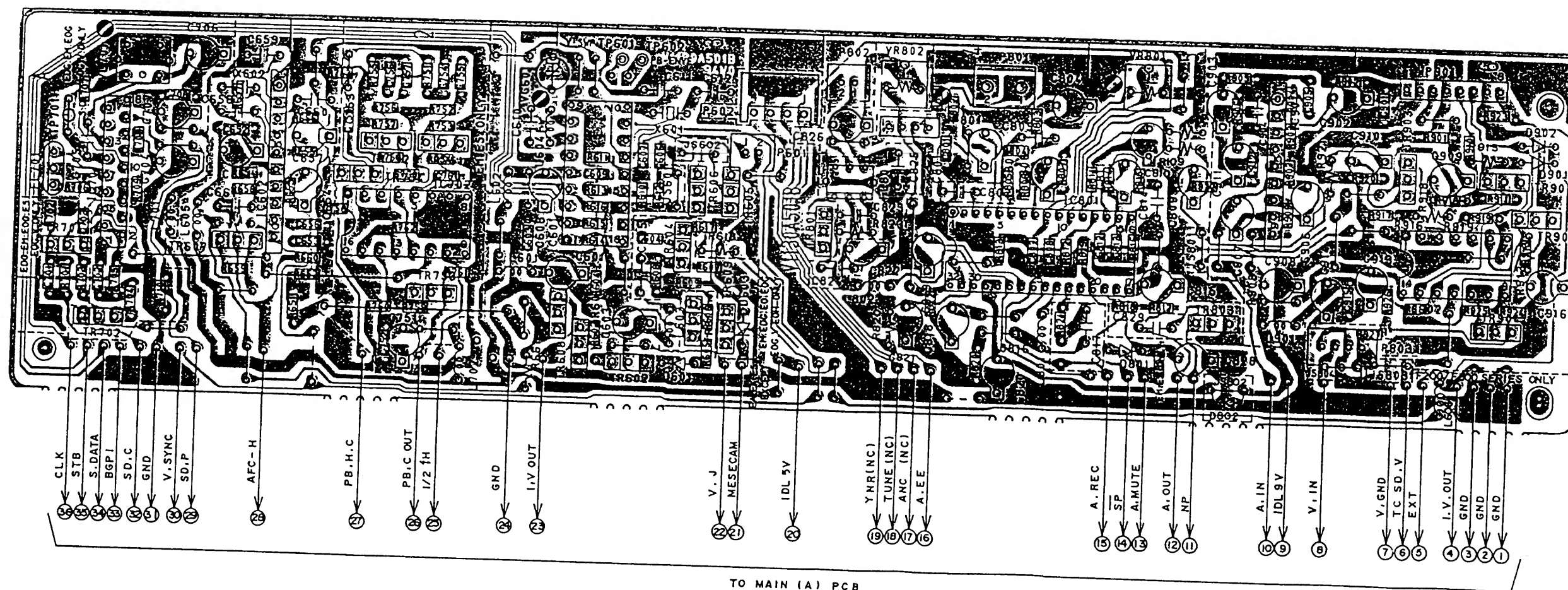
PRINCIPAL PARTS LOCATION

ICS
 IC601 A3
 IC602 A1
 IC701 A1
 IC702 A2
 IC801 A4

WP
 WP801 A4

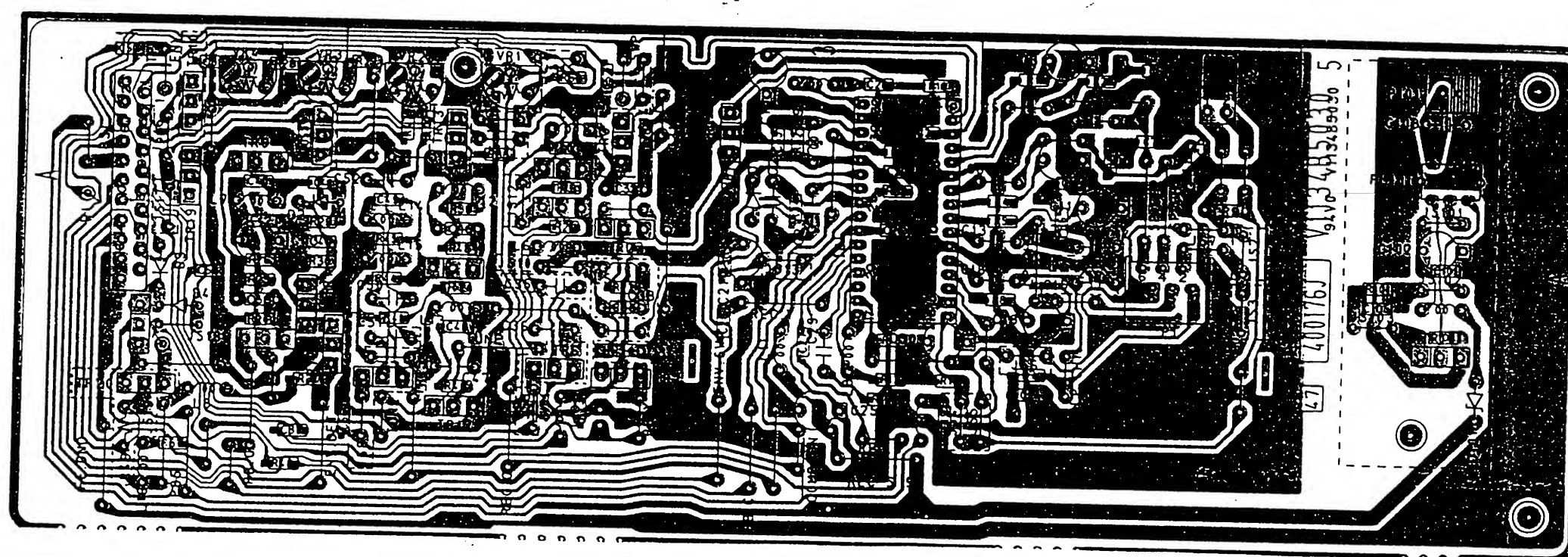
CONNECTORS
 P601 A3
 P602 A3
 P801 A4
 P802 A4
 P803 A5,6

TRANSISTORS
 TR601 A3
 TR602 A3
 TR603 A3
 TR604 A3
 TR605 A3
 TR606 A3
 TR607 A1
 TR608 A3
 TR609 A3
 TR701 A1
 TR702 A1
 TR751 A2
 TR752 A2
 TR753 A2
 TR754 A2
 TR801 A4
 TR803 A5



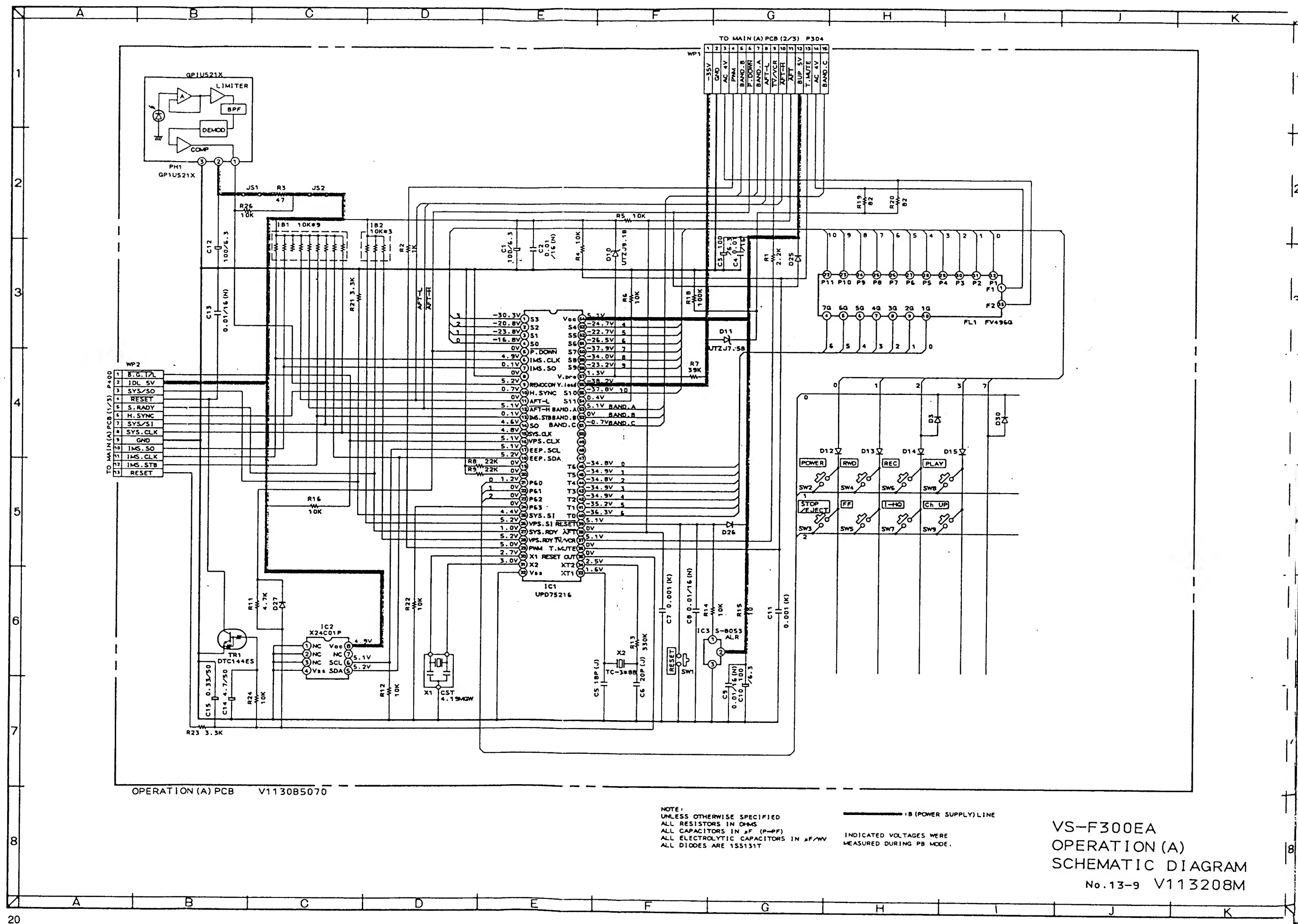
MAIN (B) PCB VII30A50IBJ1

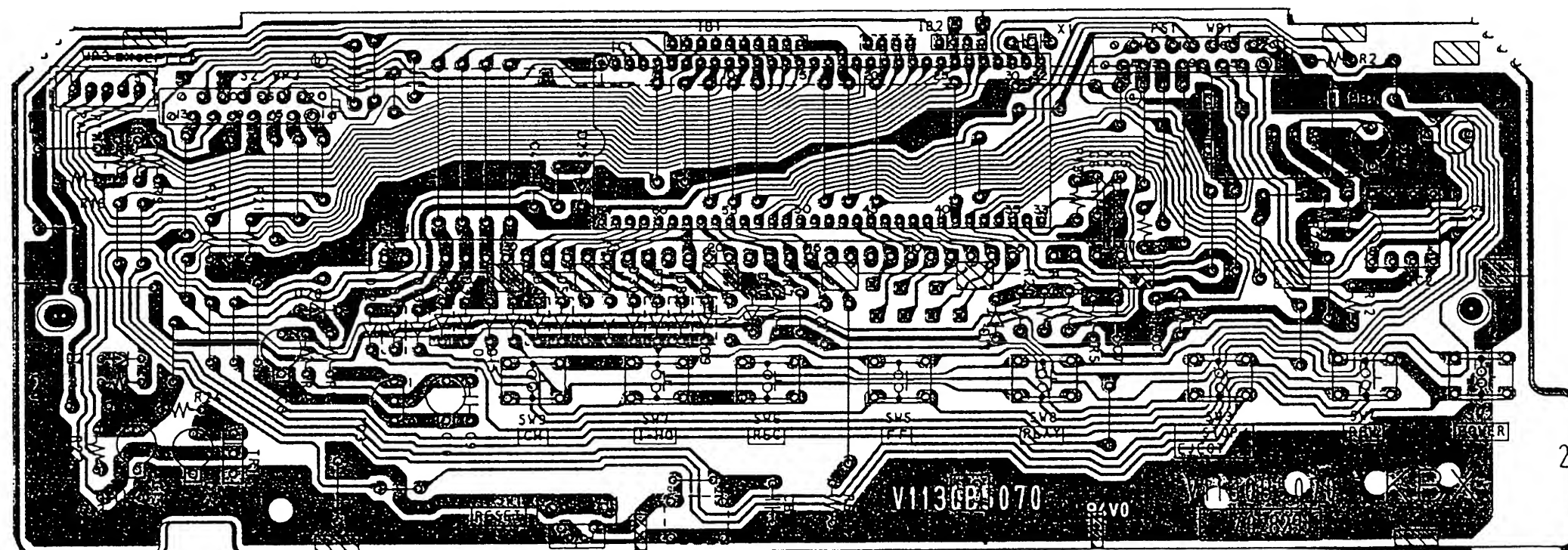
NOTE : PARTS DIFFER DEPENDING ON MODEL NUMBER.
 REFER TO SCHEMATIC DIAGRAMS FOR PARTAINING
 PARTS INFORMATION.



PRE AMP PCB VII34B5030

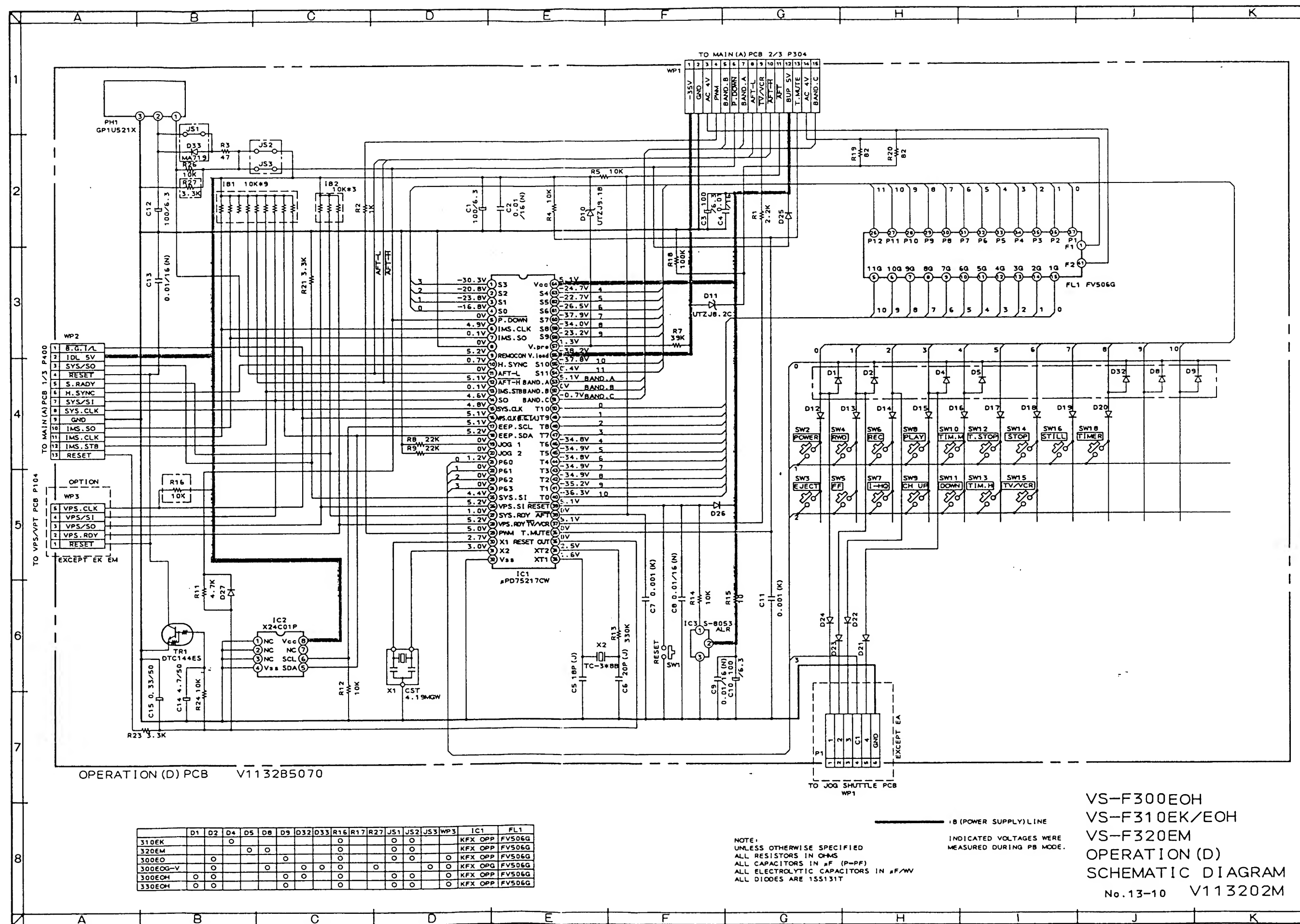
NOTE : PARTS DIFFER DEPENDING ON MODEL NUMBER.
REFER TO SCHEMATIC DIAGRAMS FOR PARTAINING
PARTS INFORMATION.

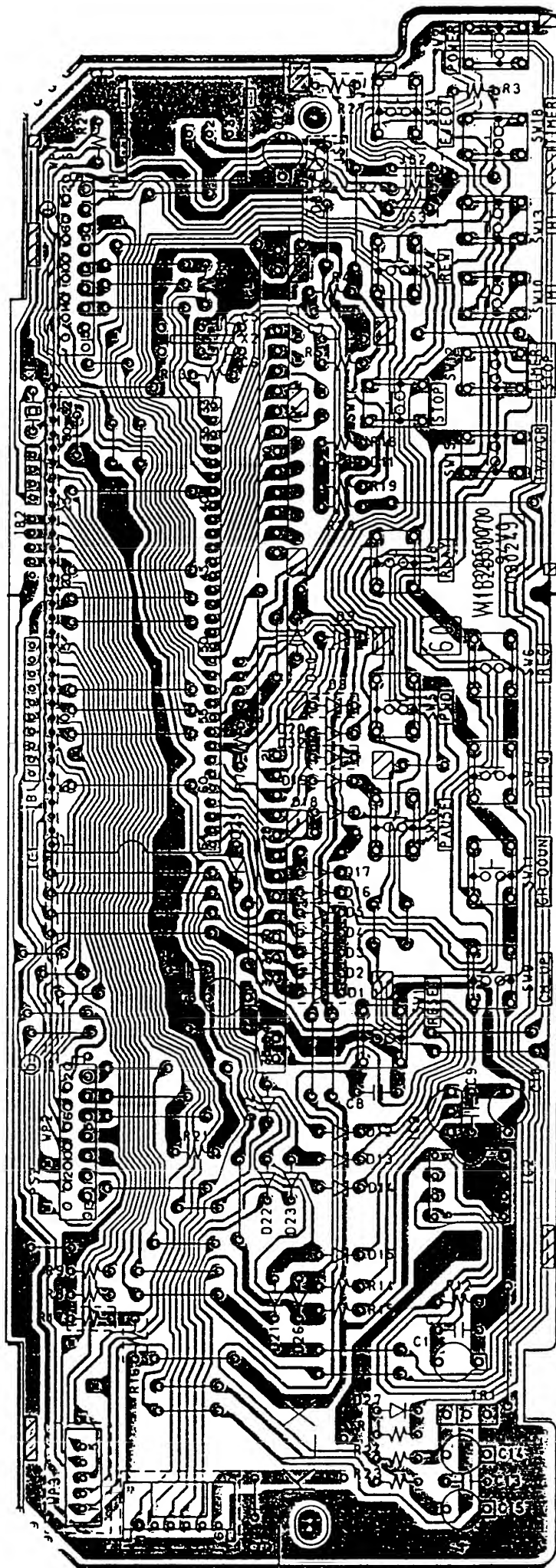




OPERATION (A) PCB V.1130B5070

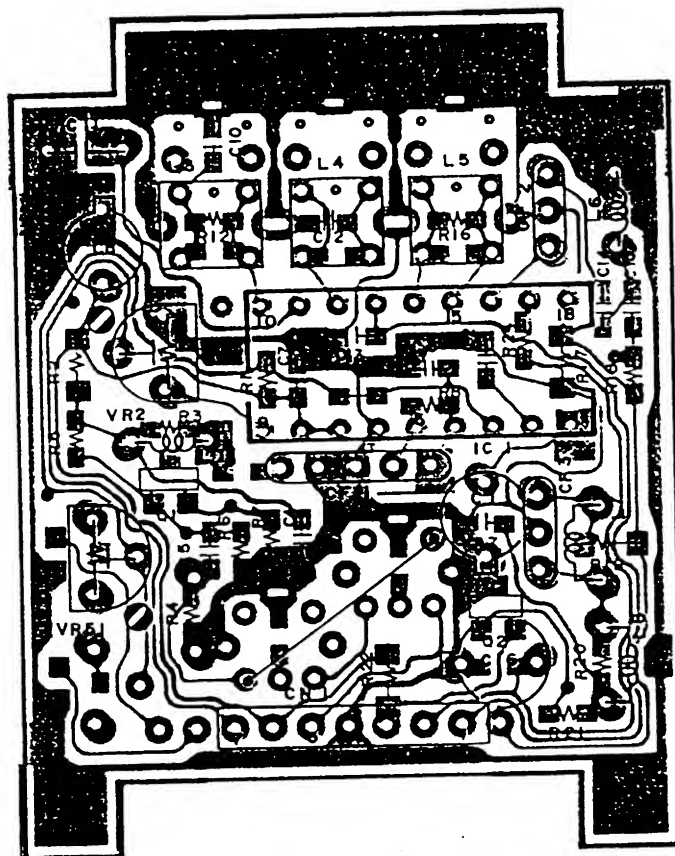
NOTE : PARTS DIFFER DEPENDING ON MODEL NUMBER.
REFER TO SCHEMATIC DIAGRAMS FOR PARTAINING
PARTS INFORMATION.



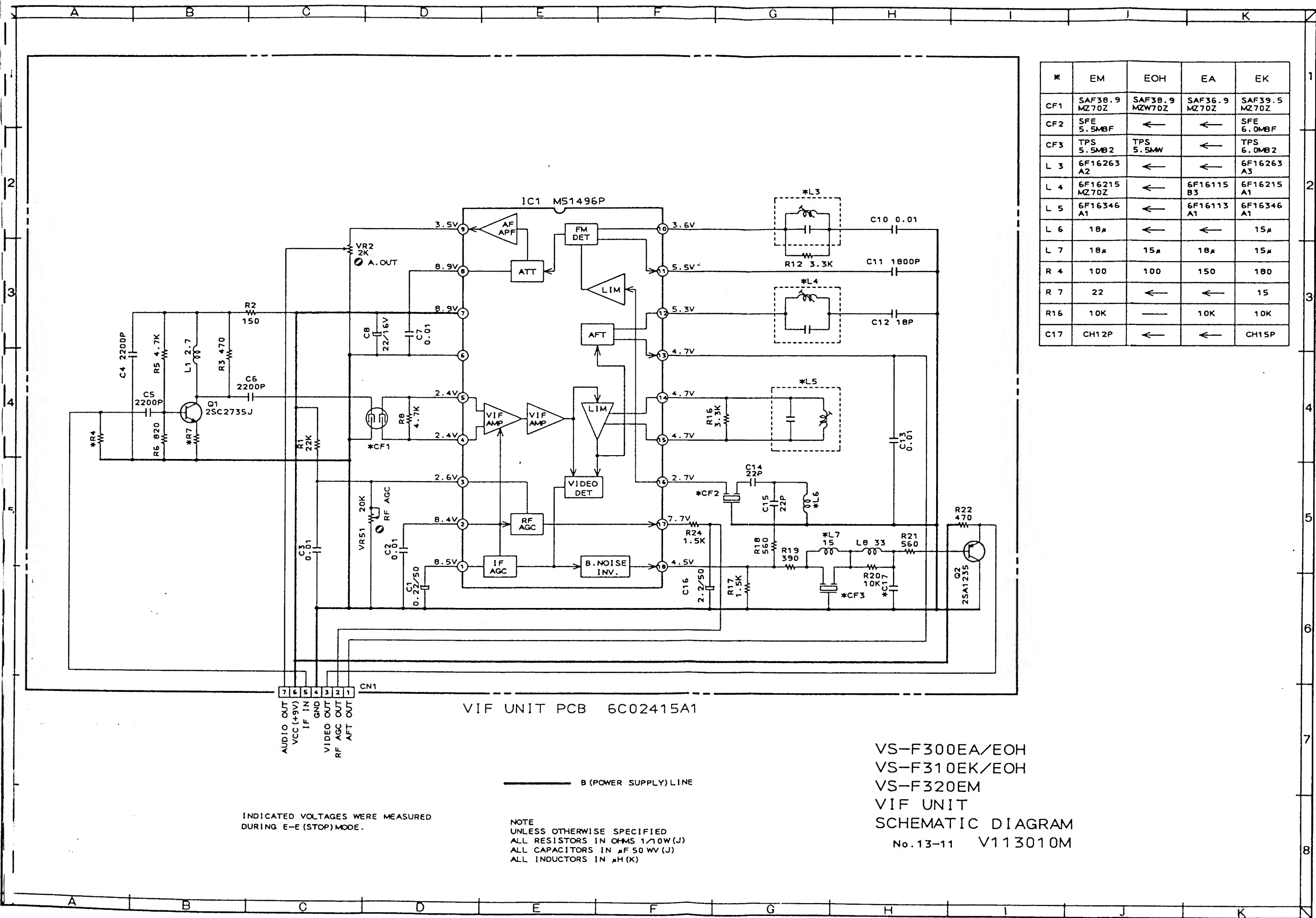


OPERATION (D) PCB VII32B5070

NOTE : PARTS DIFFER DEPENDING ON MODEL NUMBER.
REFER TO SCHEMATIC DIAGRAMS FOR PERTAINING
PARTS INFORMATION.

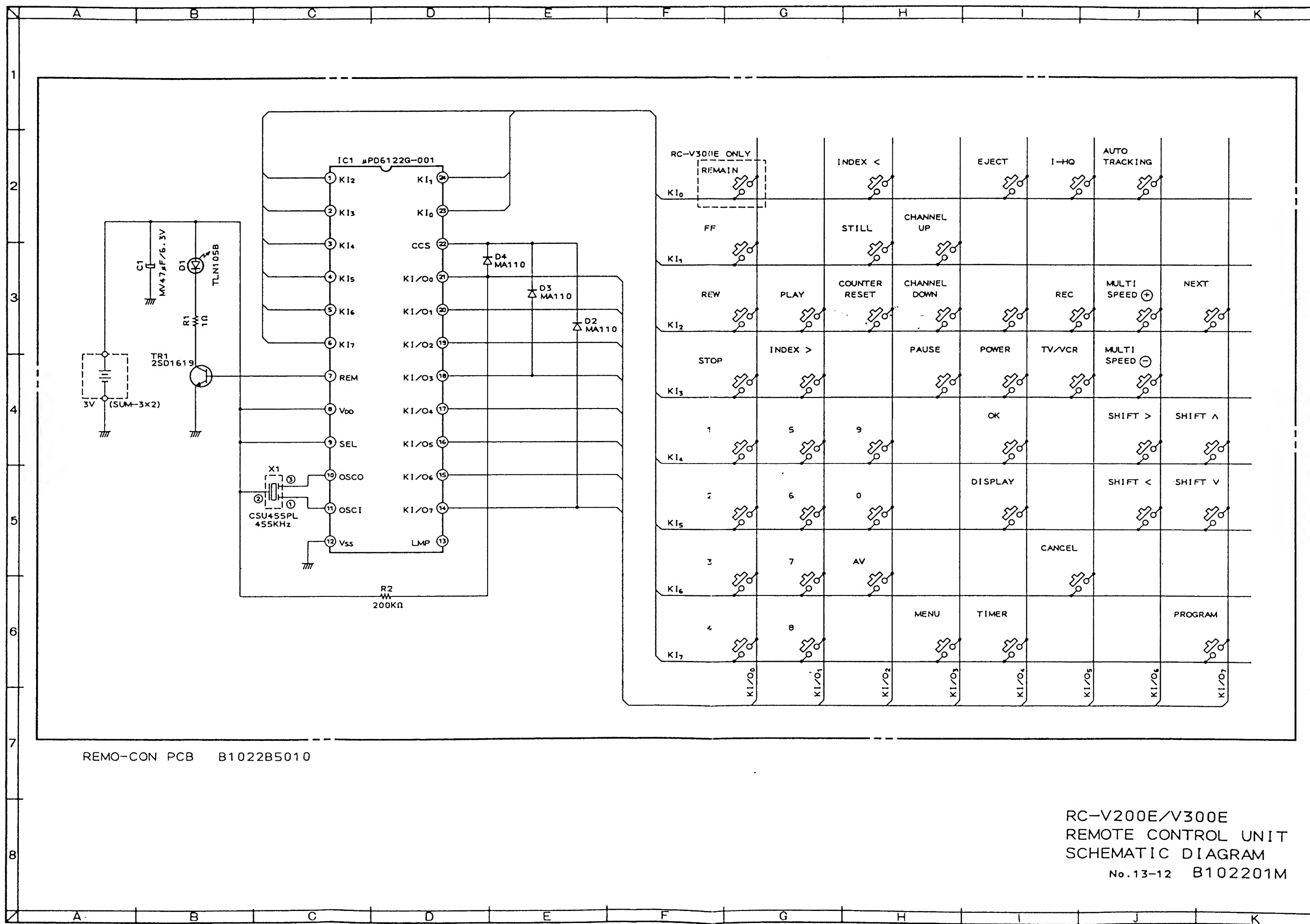


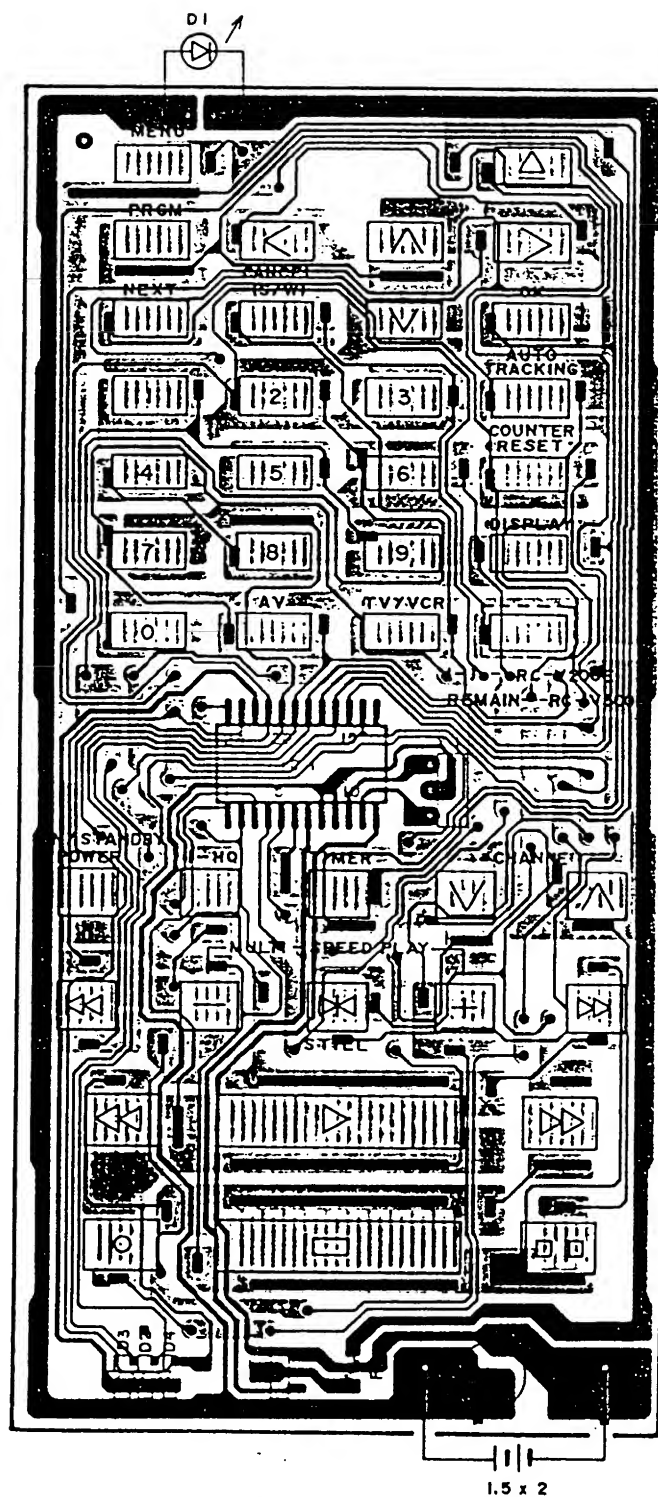
VIF UNIT 6C02415A1



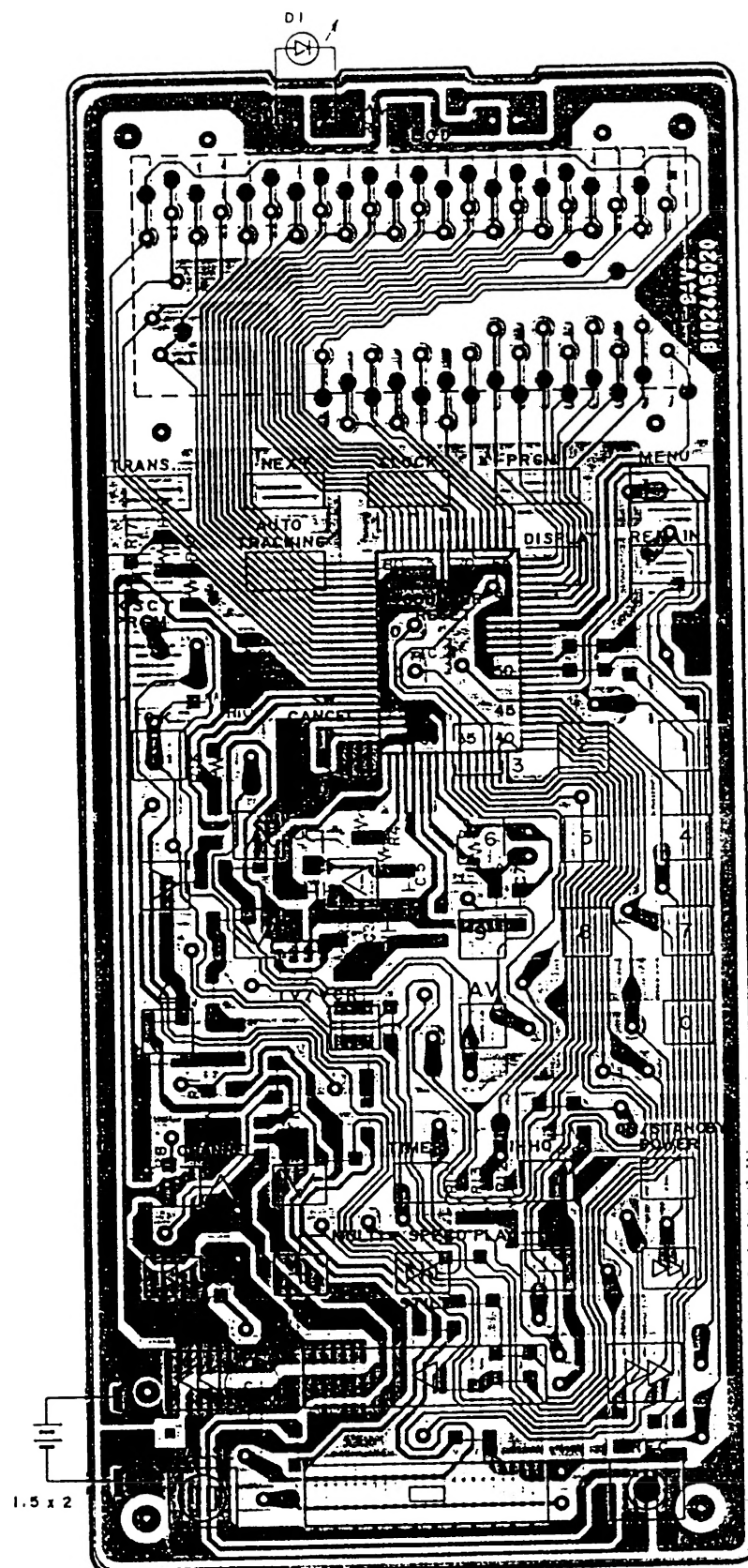
*	EM	EOH	EA	EK
CF1	SAF38.9 MZ70Z	SAF38.9 MZW70Z	SAF36.9 MZ70Z	SAF39.5 MZ70Z
CF2	SFE 5.5MBF	←	←	SFE 6.0MBF
CF3	TPS 5.5MB2	TPS 5.5MW	←	TPS 6.0MB2
L 3	6F16263 A2	←	←	6F16263 A3
L 4	6F16215 MZ70Z	←	6F16115 B3	6F16215 A1
L 5	6F16346 A1	←	6F16113 A1	6F16346 A1
L 6	18μ	←	←	15μ
L 7	18μ	15μ	18μ	15μ
R 4	100	100	150	180
R 7	22	←	←	15
R16	10K	←	10K	10K
C17	CH12P	←	←	CH15P

VS-F300EA/EOH
VS-F310EK/EOH
VS-F320EM
VIF UNIT
SCHEMATIC DIAGRAM
No.13-11 V113010M

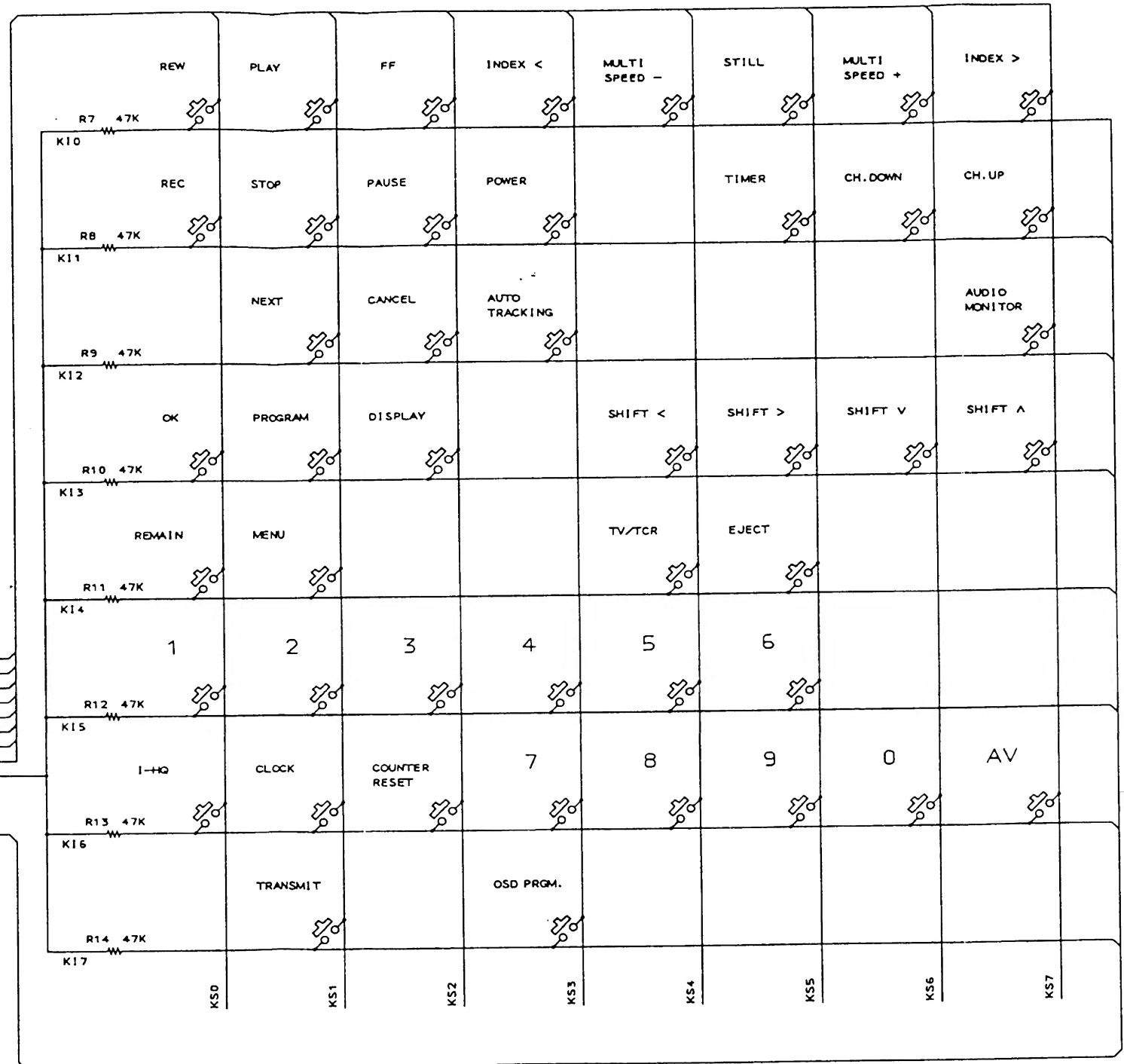
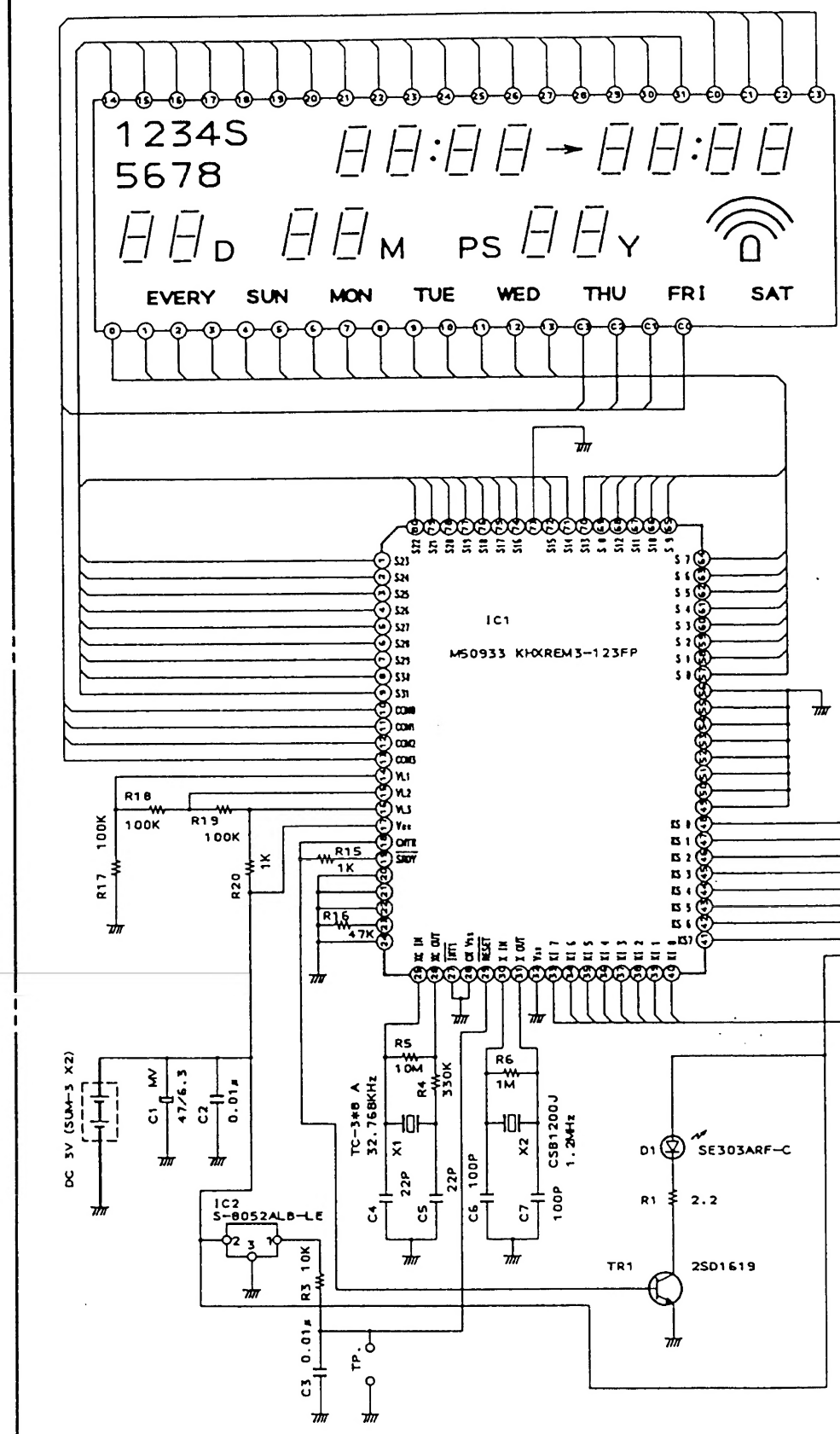




REMO-CON PCB BI022B5010



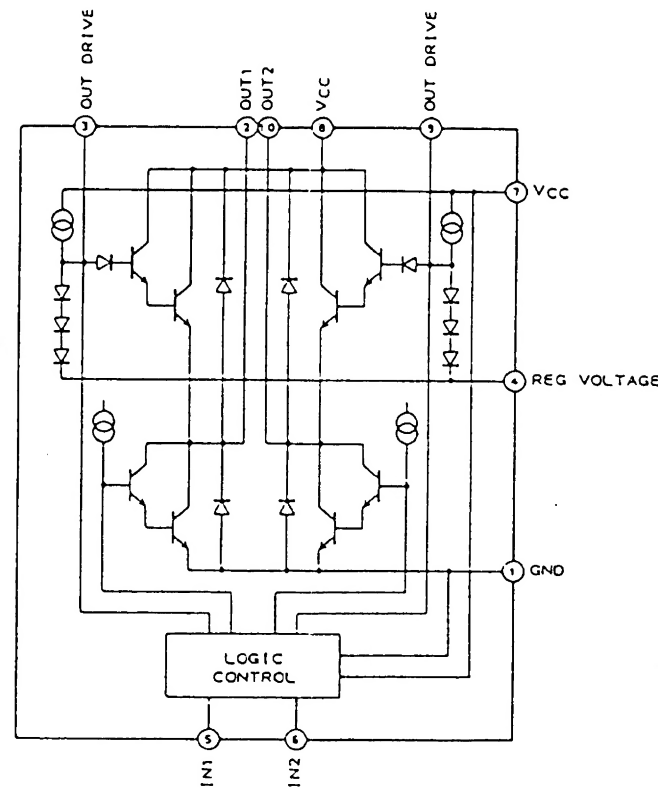
REMO - CON PCB BIO24A5020



RC-V302E
REMOTE CONTROL UNIT
SCHEMATIC DIAGRAM
No.13-13 B1024.01M

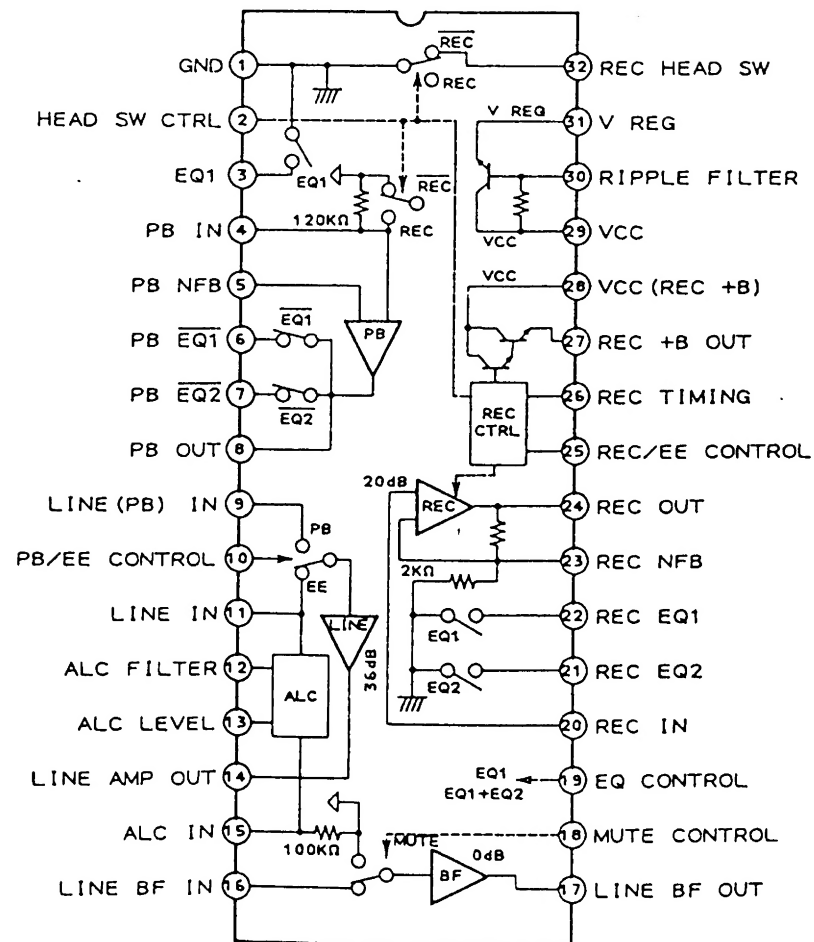
REMO-CON PCB B1024A5020

BA6229 (BI-DIRECTIONAL MOTOR DRIVE)

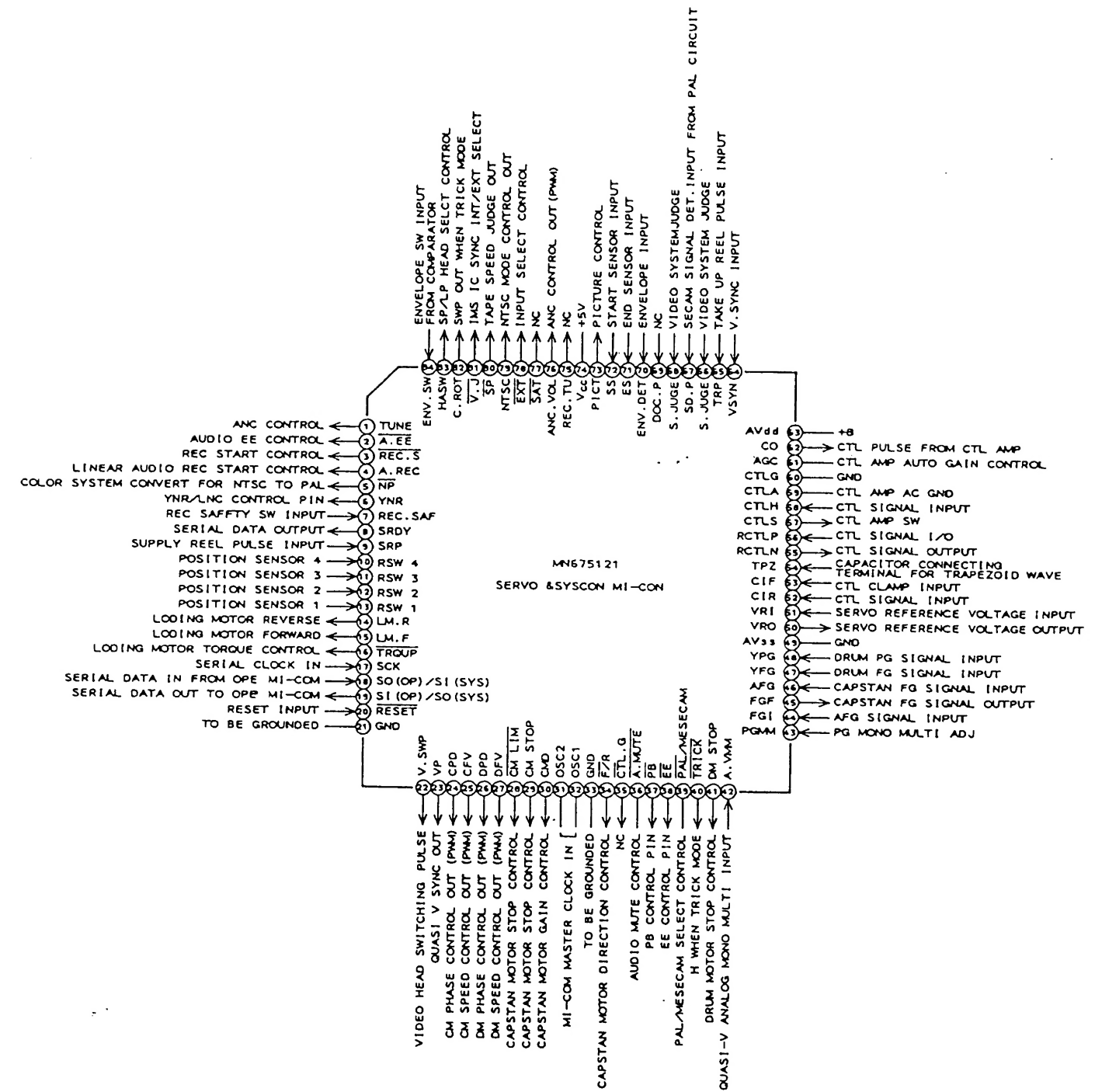


INPUT		OUTPUT		MODE
①	④	②	③	
H	H	L	L	BRAKE
L	H	L	H	CASSETTE & TAPE LOADING
H	L	H	L	CASSETTE & TAPE UNLOADING
L	L	OPEN	OPEN	STOP

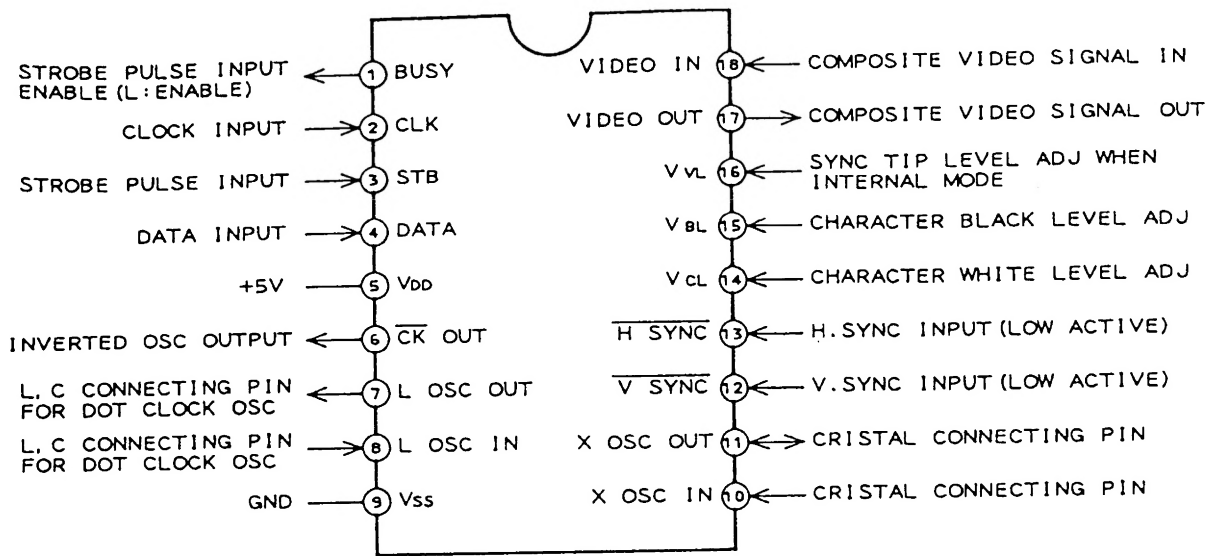
BA7765AS (AUDIO SIGNAL REC/PB AMPLIFIER)



MN675121 KBXSYS1 (SERVO/SYSCON MI-CON)



μPD6450 (CHARACTER GENERATOR)



μPD75216 (OPERATION MI-COM)

